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A PROPOSED ENLISTED ADVANCEMENT  
SYSTEM FOR THE NAVY

by

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A PROPOSED ENLISTED  
ADVANCEMENT SYSTEM FOR THE NAVY

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## INTRODUCTION

### Purpose of the Study

The technological explosion of recent years has had an enormous impact on the concepts of warfare utilized by our military. The use of nuclear energy, supersonic aircraft, and guided missiles has considerably altered the basic structure of our military organization. The rudimentary skills that were basic to the conduct of war have been replaced by highly technical and scientific systems. To operate and maintain these modern systems both efficiently and effectively, the military has had to concentrate on recruiting and retaining competent personnel who can be quickly trained as highly skilled technicians.

Since this explosion was not limited to the military alone and other segments of the economy were also affected, the military and private industry were placed in direct competition for the skilled manpower available. The military has run a poor second in the acquisition of these skills. Private industry has long realized that major considerations in gathering an effective work force must include attractive incentives. This entails a wage scale that keeps pace with our changing economy and positive measures to enhance the prestige of lower and middle management.

The military has encountered many problems in trying to keep its incentives at the same level as private industry. Many of its highly skilled technicians have been attracted by the benefits offered in private industry and have left the service. The military, with a considerable loss in its







trained and experienced personnel, has utilized a rapid promotion system to make the service more attractive as a career. Therefore, petty officer grades have been filled with inexperienced persons who lack the maturity and qualities of leadership desirable to assume the responsibilities of these grades. Consequently, these responsibilities have been delegated to junior commissioned officers. This fact has had a detrimental effect on the status and prestige of the petty officer.

Today, these problems still remain unremedied. Many of our highly skilled technicians are leaving the service at the end of their first term of enlistment for jobs in private industry which are more attractive with regard to both salary and prestige.

With these problems in mind, this study proposes and examines the advantages and disadvantages of a new type of enlisted advancement system for the Navy. The entire structure is proposed to be spaced over a period of twenty-five years so that a man will be able to continue to advance to higher levels throughout his career. This system will expand the length of time spent within each grade so that a man may gain additional experience before he has to assume the responsibilities of a higher grade. Within each grade will be step levels, similar to those in the Federal civil service, at which point a man can achieve a pay increase based on his technical skill. The system will also have a wage scale that is comparable to the same levels of responsibility in private industry.

### Plan of Presentation

The purpose of this study is to propose a Navy advancement system which will encourage the retention of highly skilled personnel.



In Chapter I, the problems of retention of highly qualified personnel are discussed. It is shown that the military services need to become more competitive with private industry in the labor market in order to retain skilled technicians.

The present advancement system and its deficiencies are explained in Chapter II. Among the points brought out in this chapter are that too rapid advancement produces inexperienced petty officers, a lack of comparability in compensation between the military and civilian industry, and a need for billet analysis in every rating.

The proposed advancement system and its distinguishing features are explained in detail in Chapter III. A promotion system for producing responsible petty officers, a competitive wage scale, and a continuance rate to produce satisfactory manpower flow within each rating are examined in this chapter.

The scope of the problem and the methodology utilized in conducting a survey with regard to the proposed advancement system are discussed in Chapter IV.

The proposed system is evaluated by analyzing the survey which was conducted with regard to the system in Chapter V.

A general summary with conclusions and recommendations is presented in the last chapter.



The first part of the paper is devoted to a general discussion of the problem of the existence of a solution of the system of equations (1) for arbitrary values of the parameters  $\alpha$  and  $\beta$ . It is shown that the system has a solution for arbitrary values of the parameters  $\alpha$  and  $\beta$  if and only if the matrix  $A$  is nonsingular. In this case the solution is unique. If the matrix  $A$  is singular, then the system has a solution only for certain values of the parameters  $\alpha$  and  $\beta$ . In this case the solution is not unique. The second part of the paper is devoted to a detailed study of the properties of the solution of the system of equations (1) for arbitrary values of the parameters  $\alpha$  and  $\beta$ . It is shown that the solution is continuous with respect to the parameters  $\alpha$  and  $\beta$  if and only if the matrix  $A$  is nonsingular. If the matrix  $A$  is singular, then the solution is discontinuous with respect to the parameters  $\alpha$  and  $\beta$ . The third part of the paper is devoted to a study of the properties of the solution of the system of equations (1) for arbitrary values of the parameters  $\alpha$  and  $\beta$ . It is shown that the solution is bounded with respect to the parameters  $\alpha$  and  $\beta$  if and only if the matrix  $A$  is nonsingular. If the matrix  $A$  is singular, then the solution is unbounded with respect to the parameters  $\alpha$  and  $\beta$ . The fourth part of the paper is devoted to a study of the properties of the solution of the system of equations (1) for arbitrary values of the parameters  $\alpha$  and  $\beta$ . It is shown that the solution is stable with respect to the parameters  $\alpha$  and  $\beta$  if and only if the matrix  $A$  is nonsingular. If the matrix  $A$  is singular, then the solution is unstable with respect to the parameters  $\alpha$  and  $\beta$ . The fifth part of the paper is devoted to a study of the properties of the solution of the system of equations (1) for arbitrary values of the parameters  $\alpha$  and  $\beta$ . It is shown that the solution is periodic with respect to the parameters  $\alpha$  and  $\beta$  if and only if the matrix  $A$  is nonsingular. If the matrix  $A$  is singular, then the solution is aperiodic with respect to the parameters  $\alpha$  and  $\beta$ . The sixth part of the paper is devoted to a study of the properties of the solution of the system of equations (1) for arbitrary values of the parameters  $\alpha$  and  $\beta$ . It is shown that the solution is convergent with respect to the parameters  $\alpha$  and  $\beta$  if and only if the matrix  $A$  is nonsingular. If the matrix  $A$  is singular, then the solution is divergent with respect to the parameters  $\alpha$  and  $\beta$ . The seventh part of the paper is devoted to a study of the properties of the solution of the system of equations (1) for arbitrary values of the parameters  $\alpha$  and  $\beta$ . It is shown that the solution is oscillatory with respect to the parameters  $\alpha$  and  $\beta$  if and only if the matrix  $A$  is nonsingular. If the matrix  $A$  is singular, then the solution is non-oscillatory with respect to the parameters  $\alpha$  and  $\beta$ . The eighth part of the paper is devoted to a study of the properties of the solution of the system of equations (1) for arbitrary values of the parameters  $\alpha$  and  $\beta$ . It is shown that the solution is monotonic with respect to the parameters  $\alpha$  and  $\beta$  if and only if the matrix  $A$  is nonsingular. If the matrix  $A$  is singular, then the solution is non-monotonic with respect to the parameters  $\alpha$  and  $\beta$ . The ninth part of the paper is devoted to a study of the properties of the solution of the system of equations (1) for arbitrary values of the parameters  $\alpha$  and  $\beta$ . It is shown that the solution is symmetric with respect to the parameters  $\alpha$  and  $\beta$  if and only if the matrix  $A$  is nonsingular. If the matrix  $A$  is singular, then the solution is non-symmetric with respect to the parameters  $\alpha$  and  $\beta$ . The tenth part of the paper is devoted to a study of the properties of the solution of the system of equations (1) for arbitrary values of the parameters  $\alpha$  and  $\beta$ . It is shown that the solution is antisymmetric with respect to the parameters  $\alpha$  and  $\beta$  if and only if the matrix  $A$  is nonsingular. If the matrix  $A$  is singular, then the solution is non-antisymmetric with respect to the parameters  $\alpha$  and  $\beta$ .

## CHAPTER I

### THE ENLISTED RETENTION PROBLEM

#### Developing the Skilled

"There was a time when our readiness could be maintained with fewer hard-to-train technical personnel";<sup>1</sup> however, today's wars are fought with exotic weapons systems which must be manned and maintained by highly skilled technicians. "As we continue to introduce and operate more complex weapons systems, our critical dependence upon technically proficient, experienced people will become even more pronounced."<sup>2</sup> Developing this type of individual requires a high quality input to training, an extensive training program, and a long period of on-the-job training before he can be considered skilled enough to man and maintain a weapon system efficiently and effectively.<sup>3</sup> A newly trained recruit going into a job as a replacement cannot do the job as satisfactorily as the man who has several years experience. The more

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<sup>1</sup>Admiral David Lamar McDonald, "Selected Excerpts from Statement on Fiscal Year 1966 Budget before the Defense Subcommittees on Appropriations," quoted in Fiscal Year 1966 Department of the Navy Budget Digest, Naval Supply Office Publication No. 1355 (Philadelphia, Pa.: Naval Supply Depot, 1966), p. 19.

<sup>2</sup>Paul Henry Nitze, "Statement before the Defense Subcommittee, House Committee on Appropriations," quoted in Fiscal Year 1965 Department of the Navy Budget Digest, Naval Supply Office Publication No. 1355 (Philadelphia, Pa.: Naval Supply Depot, 1965), p. 10.

<sup>3</sup>Report to the Secretary of Defense by the Defense Advisory Committee on Professional and Technical Compensation for Military Personnel (Washington: U. S. Government Printing Office, May, 1957), p. 43.





complex the weapon system, the longer the training period must be.<sup>4</sup>

Obtaining a proper return from a technician who has been trained at one of the Navy service schools requires a substantial period of productive service. This retention period is not being realized to any acceptable economic degree, especially with regard to the technicians who require the more lengthy and costly training.<sup>5</sup>

A recent study conducted on the sonar technician rating, one of the most critical ratings in the Navy today, illustrates the significance of this statement. Information gathered from the fleet and sonar school personnel has indicated that the primary responsibility for maintaining and operating sonar equipment lies with pay grades E-5 and E-6. Due to the low reenlistment rates, it is within these two grades that the most critical shortage lies. Most sonar technicians (ST) are third (E-4) or second (E-5) class petty officers at the end of their first four-year enlistment. Approximately eighty-five per cent of these men fail to reenlist which leaves few men available for advancement to second (E-5) and first (E-6) class levels.<sup>6</sup>

In addition to this shortage, the experience level of the personnel in pay grade E-5 may be insufficient. The minimum time required for

<sup>4</sup>Everette E. Johnston, Jr., Preliminary Report on Identifying Retention-Related Variables, A Report to the U. S. Naval Personnel Research Activity (San Diego, Calif.: U. S. Naval Personnel Research Activity, December, 1964), p. 1.

<sup>5</sup>Report to the Secretary of Defense on Professional and Technical Compensation for Military Personnel, op. cit., p. 44.

<sup>6</sup>Henry C. Rosicky, Sonar Technician Rating: General Analysis of Problem Areas, A Report to the Naval Personnel Systems Research Department (Washington: Personnel Research Laboratory, January, 1966), pp. 3-4.

The first part of the report is devoted to a general survey of the situation in the country.

The second part of the report is devoted to a detailed description of the various departments.

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advancement to E-5 is twenty-seven months; however, approximately three and a half years are required to attain the formal training and on-the-job experience necessary to become sufficiently qualified to technically maintain sonar equipment. Therefore, individuals can advance to the STG2 (Sonar Technician Surface, Second Class) level as much as a year prior to being fully qualified to perform technical maintenance. (See Appendix A, Table 1.) At the same time, it is these personnel, in many cases, who must perform work for which they do not have the proper amount of experience due to a lack of experienced personnel at higher grade levels. In fact, many senior sonar men aboard ship are second and third class petty officers.<sup>7</sup>

Because there is insufficient time during the first enlistment to develop the ability to evaluate visual and audible sonar contact information and the ability to make accurate classifications, many sonar technicians do not become proficient within this time. Hence, the job of performing the work must be assumed by senior petty officers. Since the majority of sonar technicians do not remain in the Navy, it becomes apparent that the efficiency of the sonar equipment is not in all instances fully realized because there are insufficient numbers of skilled petty officers to do the job.

"In summary, the Navy's capital investment in ST's is high during their first few years in the Navy. First term ST's receive considerable formal and on-the-job training while the service that they provide is limited both in length and quality. It appears evident that the Navy does not receive an equitable return on its investment over the first four-year enlistment. Further, it is questionable whether the 15% of surface ST's

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<sup>7</sup>Ibid., pp. 4-5.





that reenlist are able to provide sufficient return in services to compensate for the loss sustained on the 85% that do not reenlist."<sup>8</sup>

Since we live in a relatively free and democratic society, individuals cannot be compelled to remain in a peacetime armed service any longer than the minimum length of time required by law; therefore, the Navy must attempt to retain the skilled and the competent by the use of the laws of supply and demand. This fact necessitates offering to the men whom the Navy wishes to retain the benefits and prestige comparable to those found in a civilian job with the same duties and responsibilities.<sup>9</sup>

#### Retention: Quality not Quantity

The modern military manpower problem in its simplest form is one of retaining quality and not quantity since total numbers of people available are not true measures of our defense capability. The Navy has found that it has been hard-pressed in keeping an appropriate supply of skilled manpower.<sup>10</sup> The man who has acquired military skill of a technical nature during the period of his first enlistment represents a substantial investment by the government. "Low retention is expensive. Every man in the Navy represents an investment based on the cost of training a replacement, but this is not the only loss when a man with what we call a 'hard skill' leaves the service. To the bare training cost must be added a value for his accumulated experience, his talent in his job. During 1964, 21,600 men possessing

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<sup>8</sup>Ibid., p. 6.

<sup>9</sup>Report to the Secretary of Defense on Professional and Technical Compensation for Military Personnel, op. cit., p. 44.

<sup>10</sup>Ibid., pp. 5-6.





critical hard skills left the Naval Service. Our monetary loss was not only great, but there was a concurrent serious effect upon Fleet readiness."<sup>11</sup>

The return on this investment will be measured by how many of these qualified and desirable personnel elect to reenlist. The point of time in service that would provide the Navy with the maximum gain in the development of a quality enlisted force is at the end of the first enlistment.<sup>12</sup> This is not being realized as shown in Appendix A, Table 2. Speaking specifically, the Navy is interested in retaining the highly skilled technicians who are so costly to train and are in high demand in civilian industry. Therefore, the emphasis cannot be placed on the reenlistment of a certain number of men, but rather on the retention of the skilled and the competent.<sup>13</sup> This entails examining individual ratings and determining the number of men eventually needed to fill the billets at all levels. By examining the billets at all levels, a method of planning can be established whereby the manpower flow in any particular rating can be measured. This would allow the Navy to base its estimate of needed first term retention in each particular rating on the manpower flow at each level.

The ideal billet structure is one with a broad base of billets at the lower grade levels and a steady decrease of the total number of billets as the grade levels increase. This would ideally form a pyramid. It has been found, however, that the attrition rate of personnel at each grade

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<sup>11</sup>Admiral McDonald, op. cit., p. 19.

<sup>12</sup>Report to the Secretary of Defense on Professional and Technical Compensation for Military Personnel, op. cit., p. 45.

<sup>13</sup>Johnston, op. cit., p. 1.





level is lower than the rate of personnel ready for promotion at each lower grade level. This leads to what is known in military jargon as hump areas. One solution to this problem would be to ensure that only the desired amount of personnel in each grade needed to fill future billet vacancies be reenlisted.<sup>14</sup> A method for accomplishing this will be investigated in Chapter 3.

### Critical Retention Point

At the end of the first term of enlistment, an enlisted man must make a major decision. Should he continue in the Navy and make this his life's career, or should he seek employment in civilian life? A majority of these men have received valuable training and have become skilled in a useful trade. Civilian pursuits offer many attractive, immediate and long-range economic rewards. A man must compare the advantages and disadvantages of one career against the other and thus make his decision. "Attractiveness of a service career must outweigh inducements to leave the service. We must acknowledge the great savings involved in continuous service by providing most of the benefits afforded to personnel on separation from the service."<sup>15</sup>

### A Military Man's Prestige

One of the most essential qualities sought by a man in any field of endeavor is the prestige of his position.<sup>16</sup> The relative importance of the

<sup>14</sup> Interview with Ledr. Paul R. Gates, Member of Secretary of the Navy's Task Force on Military Retention, Feb. 14, 1966.

<sup>15</sup> Final Report to the Assistant Secretary of Defense (1953) on the Future of Military Service as a Career That Will Attract and Retain Capable Career Personnel (Washington: Bureau of Naval Personnel, October 30, 1953), p. 1.

<sup>16</sup> Report to the Secretary of Defense on Professional and Technical Compensation for Military Personnel, op. cit., p. 53.





accomplishment of one's work is often expressed in the prestige of the position in the eyes of the other members of the community. The lack of this prestige has been established as being one of the major deterrents in the achievement of a higher first-term reenlistment rate.<sup>17</sup> This lack of prestige was realized as early as 1953 by the Joint Chiefs of Staff. On February 20, 1953, they forwarded a memorandum to the Secretary of Defense stating that they were becoming increasingly concerned with the growing lack of confidence among Armed Forces personnel in military service as a worthwhile and respected career. Their particular concern was with respect to the future proficiency of the military services and how this would be affected by the situation.<sup>18</sup>

This committee received hundreds of letters from active and retired military personnel as well as from the general public concerning the above situation and " . . . concluded that military service as a career that will attract and hold capable and ambitious personnel had deteriorated alarmingly in comparison with other fields of skilled endeavor."<sup>19</sup> Numerous reasons for this deterioration were cited--one was a dilution of authority and leadership due to inexperienced personnel. This necessitated an increase in centralized authority which, in turn, diminished the prestige of the noncommissioned officer. It further led to a lack of acceptance of responsibility commensurate with rank because of the lack of authority necessary to adequately discharge this responsibility.<sup>20</sup>

<sup>17</sup>Ibid.

<sup>18</sup>Final Report to the Assistant Secretary of Defense on the Future of Military Service as a Career That Will Attract and Retain Capable Career Personnel, op. cit., p. 1.

<sup>19</sup>Ibid.

<sup>20</sup>Ibid.





In 1955, a survey conducted by the Public Opinion Surveys, Incorporated, Princeton, New Jersey, under the direction of Dr. George Gallup and his staff concluded:

A career in the military service does not carry great prestige with adults, at least as of today. This is true of both officers and enlisted personnel. Inadequate financial rewards, dislike of service discipline and regimentation, lack of adequate family life and less opportunity to advance than in civilian life are the greatest drawbacks of a military career in the public's mind.

Survey evidence indicated that the military services would most likely succeed in their efforts to attract and retain the high quality of personnel necessary by increasing financial benefits, by encouraging a more normal family life for service personnel wherever possible and improving housing conditions.<sup>21</sup>

"In analyzing the above subject of prestige, the 'Cordiner Committee' concluded that lowered noncommissioned officer prestige not only adversely affected the reenlistment intentions of senior career personnel, but that it results in poorer administration and removes the goals and incentives for a first-term man to advance and make a career of the Service. It was further concluded that the present level of economic incentives offered to enlisted men is the major cause of low prestige as the comparatively low standard of living of enlisted personnel commands little respect in the community."<sup>22</sup>

An enlisted career symposium was held in February of 1957 by the U. S. Office of Naval Operations. The conferees observed that much of the prestige that had been associated with the grade of chief petty officer and petty officer first class had been lost. They voiced the opinion that officers no longer respected the leadership ability and judgment of senior petty officers, and consequently, were not delegating to them the appropriate

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<sup>21</sup> Report to the Secretary of Defense on Professional and Technical Compensation for Military Personnel, op. cit., pp. 58-59.

<sup>22</sup> Ibid.

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authority and responsibility necessary to manage the affairs of a division. They also concluded that senior petty officers, predominately technicians, who had been advanced rapidly had failed to measure up to their leadership responsibilities. It was further stated that petty officers who are rapidly advanced do not have the same practical experience in leadership as men in slower moving ratings.<sup>23</sup>

The problem of prestige seems no better today than it was in 1953. A survey of naval personnel was conducted during June, 1965, for attitudes and opinions on various aspects of naval service. Of a population of 559,033, a sample of 16,538 was selected which represented 3% of the population. One of the questions asked concerned the prestige of serving in the Navy. 18% of those polled felt that prestige was good, 37% felt that it was fair, 30% felt that it was bad, and 2% had no opinion.

Another question asked concerned a comparison of job prestige between civilian life and military life. 11% felt the Navy better, 32% felt the Navy and civilian the same, 48% felt that the Navy was worse than civilian, and 10% had no opinion.<sup>24</sup>

Although no one problem can be singled out and wholly blamed for the Navy's loss of competent personnel, it becomes readily apparent from what has been stated heretofore and from the answers to the above two questions

<sup>23</sup> Report to the U. S. Office of Naval Operations by the Ad Hoc Committee on Enlisted Career Symposia Recommendations (Washington: Bureau of Naval Personnel, February 12, 1957), pp. 39-40.

<sup>24</sup> Navy Personnel Survey, Prepared by the Personnel Surveys Division (Washington: Bureau of Naval Personnel, 1965), pp. 24-28.





that the lack of prestige within the enlisted ranks has a definite influence on the retention problem.

### The Lure of Civilian Employment

The lure of civilian employment opportunities has been and still remains the major cause of the Navy's high turnover rate.<sup>25</sup> The enlisted man is confronted with long periods of enforced absence from home, uncomfortable living quarters, adverse working conditions and small compensation for his efforts. Because of these conditions, advantages of civilian employment become even more attractive to the first-term enlisted man.

To gather actual fact data regarding opportunities for military men in civilian occupations, the "Cordiner Committee" engaged in 1956 a civilian management consulting firm, The McKinsey Company. The significant facts that were produced by this consulting firm were:

. . . The serviceman concluding his first term of service can normally expect higher pay in a starting civilian job than he is receiving in the military; . . . promotional opportunities in civilian life are greater than those afforded the career enlisted man; . . . Fringe benefits no longer favor the enlisted man over his civilian counterpart except for the 20 year retirement option.<sup>26</sup>

A study in career motivation for the Bureau of Naval Personnel further illustrated that the role of economics or of civilian occupational opportunities cannot be contradicted as deterrents to career service. Historically, fringe benefits provided to the military have far exceeded those

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<sup>25</sup> Report to the Secretary of Defense on Professional and Technical Compensation for Military Personnel, op. cit., p. 59.

<sup>26</sup> Ibid.



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available in private industry and seemed to compensate for some of the difficulties of military life; however, industry now offers benefits which challenge or even surpass those of the services. To aggravate the situation even more, some of the reduced prices in the Navy Exchange are hardly distinguishable from (and at times higher than) those in retail stores and discount houses.<sup>27</sup>

The loss of experienced men to industry was also a problem realized by the Civil Service Commission. At the same time that the "Cordiner Committee" was studying military retention problems, they were also doing a study on civil service retention problems. It was found that the cause of these losses to industry was inherent in the system of compensation utilized by Federal civil service. The system in use was not flexible and responsive to competitive pressures. "In private industry, the specialist received the going rate."<sup>28</sup> Fringe benefits were being matched or even exceeded by private industry, and the status of the individual was not highly recognized in Federal civil service.

The findings of the "Cordiner Committee" were that the system did not effectively:

- a. Adjust to market rates by particular skills
- b. React to changes in the general economy
- c. Maintain internal alignment
- d. Provide flexibility to accommodate individual worth
- e. Provide flexibility to meet unusual environment and work situations.<sup>29</sup>

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<sup>27</sup>Albert Glickman, L. Learner, and A. J. Spector, Studies in Career Motivation I--Basic Plan, Bureau of Naval Personnel Technical Bulletin 59-3 (Washington: U. S. Naval Personnel Research Field Activity, 1959), p. 3.

<sup>28</sup>Report to the Secretary of Defense by the Defense Advisory Committee on Professional and Technical Compensation for Civilian Personnel (Washington: U. S. Government Printing Office, May, 1957), pp. 5-6.

<sup>29</sup>Ibid., p. 6.





From these findings eventually came the Federal Salary Reform Act of 1962. This act established a system of salary rates, based on a study of the structure of salary rates in private industry, which would make possible the employment of persons well qualified to conduct and administrate the Government's programs. It established that Federal salary rates shall be comparable with those of private industry for the same levels of work.<sup>30</sup>

This type of system has not been established for military compensation. There is not in existence at the present time any one document that has a clear-cut statement of concepts which apply to military compensation.<sup>31</sup> Lacking this clear statement of concepts, the Department of Defense has been hard-pressed to justify recommendations for changes in compensation. As a result, individual services have adopted their own approaches to military compensation; hence, inter-service friction. "The lack of an agreed upon compensation concept is in effect indicative of the lack of recognition that the government has an obligation to the individual serviceman in describing the goals of compensation in the manner industry has to its employees."<sup>32</sup>

The "Cordiner Committee" recognized the need for a concept of military compensation and recommended in its report a fundamental modernization of compensation practices that embodied the following:

<sup>30</sup> Final Report to the Secretary of Defense by the U. S. Department of Defense Inter-Service Study Groups Appointed to Study Military Compensation, October, 1964 (in the files of the Army Library, Pentagon), p. 2-3.

<sup>31</sup> Ibid., p. 2-4.

<sup>32</sup> Ibid., pp. 2-4, 2-5.





1. A compensation system that will attract intelligent people possessing a strong sense of responsibility to their country and to their families, and sufficient pay to enable them to discharge their responsibilities to both simultaneously.
2. A compensation system with incentives that bear a direct relation to the effort or contribution of the individual.
3. A compensation system designed to encourage meritorious performance and advancement to higher responsibilities with reduced emphasis on monetary reward for total length of service.
4. A compensation system with a broad pricing base for identification of a variety of skills as represented in the varying needs of different service situations, with controls to insure that rewards are genuinely given where deserved.
5. A compensation system with compensation levels reasonably comparable to those paid people employed elsewhere in similar positions and occupations.
6. A compensation system susceptible of rapid and equitable adjustment to compensate for changes in the national economy.<sup>33</sup>

These concepts were analyzed by the "Inter-Service Study Group" which was appointed to study military compensation; for the most part, it was found that they were desirable as long-range objectives for military compensation. However, acceptance of some of them would be complicated by several factors.<sup>34</sup> One of these factors was that in the lower enlisted grades, the tendency has been to rely on the draft as a substitute for a competitive place in the labor market. It was further pointed out that there is a distinct possibility that the draft could be eliminated at some future time, which would leave the defense capability low with respect to quality manpower. It would be essential in this case to compete in the

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<sup>33</sup> Report to the Secretary of Defense on Professional and Technical Compensation for Military Personnel, op. cit., pp. 12-13.

<sup>34</sup> Final Report to the Secretary of Defense by the U. S. Department of Defense Inter-Service Study Groups Appointed to Study Military Compensation, op. cit., p. 2-7.





labor market, and it was proposed that this would have the effect of increasing the defense capability at a lower cost to the nation.<sup>35</sup>

This country cannot depend on the draft and at the same time hope to preserve a force of quality personnel that is necessary to maintain the high level of defense that is desired. The fact that the military was forced to accept from 95% to 98% of those who applied for enlistment in 1963 to meet manpower needs illustrates this.<sup>36</sup>

The House of Representatives investigating the need for a military pay increase stated in a 1963 report: "It is obvious to the Committee on Armed Services that we are not now retaining or attracting a sufficient number of the types of individuals so vital to our national security. This situation is becoming steadily more acute in the face of increased competition not only from private industry, but from within the Government itself."<sup>37</sup>

From all that has been stated, it appears that a comprehensive program to correct personnel deficiencies of the Armed Forces must be initiated without delay. This action should be of ranking importance to the nation with relation to our national defense capability and our defense dollar.

<sup>35</sup> Ibid., pp. 2-7, 2-8.

<sup>36</sup> Donald M. Rowland, "A Study of Relative Military and Civilian Pay, 1953-63" (unpublished Master's dissertation, Library, George Washington University, 1964), p. 5.

<sup>37</sup> U. S. Congress, House, Military Pay Increase, 88th Cong., 1st Sess., 1963, Rept. 208, p. 5.





The present compensation practices of the Armed Forces are clearly out of step with the rest of the economy and are a detriment to the needs of a technically advanced form of national defense. They are clearly contrary to all that has been learned about human motivations and can unmistakably be identified as a major impediment to national security.

A modernization of compensation practices will create the incentive for retention--a fundamental prerequisite for effective personnel control measures. This is required to maintain a work-force balanced by skills which will attain optimum performance of present and future weapons.<sup>38</sup>

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<sup>38</sup> Report to the Secretary of Defense on Professional and Technical Compensation for Military Personnel, op. cit., pp. 11-12.



## CHAPTER II

### THE PRESENT ADVANCEMENT SYSTEM

#### Background

The concepts of advancement, designed to satisfy the needs which the Navy has for fulfilling its mission, have had many changes since the birth of the United States Navy. Because of technological changes and the enlargement of our Nation's sphere of influence, the Navy has had to expand the number of jobs to be accomplished and increase its complement of manpower accordingly.

The present advancement system was established in 1950 and was reviewed and refined in 1956. It remains in this form to the present day, with minor additions and deletions.<sup>1</sup> The objectives of the system are as follows:

1. To provide the best qualified personnel in each rating and pay grade in accordance with the needs of the Navy.
2. To give an individual the incentive to improve his performance and professional knowledge.<sup>2</sup>

In dealing with the first objective, the Navy has tried to recruit the most talented personnel available. Its recruiters have canvassed the high schools throughout the land attempting to interest graduating young

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<sup>1</sup>Final Report to the Assistant Chief for Personnel Control by the Ad Hoc Committee for Review of the Enlisted Advancement System (Washington: Bureau of Naval Personnel, 1965), p. 1.

<sup>2</sup>Ibid.

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men in joining the Navy. Insufficient numbers of high school graduates have been attracted by the naval service, however, and drop-outs have also been recruited.

After entering the naval service, a recruit is sent to basic training for a period averaging three months. While in training, he is given a series of written and oral tests which are used to establish his basic aptitudes. During this period of training, he is also exposed to the numerous jobs or ratings that the Navy has to offer. With the help of qualified personnel, a recruit may decide which rating he will eventually strike for. This decision is based on the recruit's interests and the skill areas he possesses as shown by the aptitude tests. It is explained to him what areas he is best suited for and in what category of ratings he will best be able to succeed.

He may be sent to a service school upon completion of basic training if he has shown a particularly high aptitude in one area. However, if no school quota is available in the particular area which he desires, he will be sent to a fleet unit and will be allowed to strike for a rating of his choice there. In most cases, the needs of the Navy are the dominating factor, and many men with average or below-average aptitudes are sent to vacant billets which must be filled. These men will eventually be allowed to strike for ratings which are associated with their particular billets, or they may possibly be transferred to a new billet later which will allow them to strike for a desired rating.

In striking for a rating while in a fleet unit, most of the knowledge is acquired by on-the-job training; however, if class "C" schools are associated with this rating and a quota is available, a man may be sent there.





If a man shows rapid progress in his on-the-job training, a class "A" school quota may be obtained for him by his unit.

### Grade Structure

To make the Navy more attractive as a career and give the enlisted man the incentive to reenlist at the end of his first term of enlistment, the Navy has established a rapid promotion system. The enlisted grade structure in this system is composed of nine grade levels. The grade E-1 is assumed upon entering the naval service and is held throughout the basic training period. Upon completion of basic training, a general knowledge examination is administered and after passing this exam, the recruit is advanced to grade E-2.<sup>3</sup> Six months from the day that he achieved E-2, he is eligible to take a general knowledge exam for advancement to grade E-3. This exam is administered locally at the discretion of the commanding officer. If the man has met all the minimum requirements and has been recommended by his commanding officer for advancement, he may take the exam. Upon passing the exam, he will be promoted to grade E-3.<sup>4</sup> Six months after achieving grade E-3 and satisfying the minimum requirements necessary for advancement, a man is eligible to take the exam for advancement to grade E-4.<sup>5</sup>

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<sup>3</sup> Bureau of Naval Personnel Manual, Bureau of Naval Personnel Publication No. 15791 (Washington: U. S. Government Printing Office, 1959), p. 276.

<sup>4</sup> Advancement in Rating of Enlisted Personnel on Active Duty, Bureau of Naval Personnel Instruction No. P1430.7D (Washington: U. S. Government Printing Office, 1963), p. 73.

<sup>5</sup> Ibid.





Advancement exams for grade E-4 through grade E-7 are given service-wide twice a year. Advancement exams for grades E-8 and E-9 are given service-wide once a year.<sup>6</sup>

The following are the minimum time requirements for advancement from grade E-4 through grade E-9:

<u>Pay Grade</u>	<u>Service Requirements</u>
E-4 to E-5	12 months in pay grade E-4
E-5 to E-6	24 months in pay grade E-5
E-6 to E-7	36 months in pay grade E-6
E-7 to E-8	48 months in pay grade E-7 and minimum total service of eleven years.
E-8 to E-9	24 months in pay grade E-8 and minimum total service of thirteen years. <sup>7</sup>

At the present time, there are seventy-two ratings in the Navy.<sup>8</sup> Each rating represents a job area which must be defined in such a manner that one man can quickly learn the minimum basic skills required to do the job. The area must also be broad enough to encompass those jobs which are specifically related. An example of this may be shown utilizing the Boilerman (BT) rating. A Boilerman grade level E-4 must know how to operate fuel oil burners, regulate the water level in a steaming boiler, operate and monitor various valves and gauges associated with boiler operations, and light-off the superheaters. This knowledge may be obtained in a fairly short period of time. A Boilerman grade level E-8 must be

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<sup>6</sup> Manual of Qualifications for Advancement in Rating, Bureau of Naval Personnel Publication No. 18068B (Washington: U. S. Government Printing Office, 1965), p. 15.

<sup>7</sup> "A Navy Briefing on Advancement," All Hands, ed. John A. Oudine (Washington: Bureau of Naval Personnel, July, 1965), p. 30.

<sup>8</sup> Manual of Qualifications for Advancement in Rating, op. cit., p. 5-6.





able to administer a division; train and supervise personnel in the construction, operation, and maintenance of naval boilers; and be knowledgeable with respect to propulsion machinery, which is an associate rating.<sup>9</sup>

The qualifications for each rating are divided into the professional or technical qualifications and the military requirements. The professional or technical qualifications are designed to give a man the minimum requirements for advancement within a particular rating. The military requirements are those applicable qualifications which all personnel are expected to demonstrate as a minimum for advancement to any pay grade within a particular rating. These qualifications are so designed that an advancement in grade cannot be achieved without an advancement in qualifications. In this manner, grade level is associated with performance level.<sup>10</sup>

### Problems with Present System

#### Length of Time Within Grade

One of the problems with the present advancement system is a product of the rapid promotion aspect. Promoting rapidly decreases the time an individual may spend in the lower grades gaining experience and developing good leadership and supervisory qualities. This fact was brought out in an enlisted career symposia held in 1957. It was stated that "... certain senior petty officers, notably technicians, who had been advanced rapidly had failed to measure up to their leadership responsibilities." Furthermore, "petty officers rapidly advanced have not had the same practical experience in leadership as men in slower moving rates."<sup>11</sup>

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<sup>9</sup>Ibid., pp. 7-7, 7-8, 7-14.

<sup>10</sup>Ibid., p. 1.

<sup>11</sup>Report to the U. S. Office of Naval Operations on Enlisted Career Symposia Recommendations, op. cit., pp. 39-40.





With further examination, it can be found that rapid promotion can be a detriment in the technical area. Technical responsibility increases with grade level, and it has been pointed out in the Sonar Technician Rating that technical experience in certain cases was not commensurate with technical responsibility.<sup>12</sup>

A man may cover the entire enlisted grade span in thirteen years, a fact which can be detrimental in two specific ways. First, the man has reached the highest goal attainable in the enlisted ranks; therefore, he has a possible seventeen years of military life ahead with no new goals to achieve. This could have a detrimental effect on his motivation and productivity. Secondly, without any incentive to strive for, he may desire to retire at the twenty year mark rather than stay for thirty. In some cases, the Navy will lose and is losing valuable people.

#### Billet Analysis

The question has been posed that perhaps the Navy is not utilizing its manpower as effectively as possible. The Navy speaks of shortages; however, there are overpopulated ratings. In order to evaluate this question properly, the billet structure must be examined, and an identification of the skill requirements must be associated with the given billet.<sup>13</sup>

In May of 1965, a billet analysis was conducted by the U. S. Naval Research Activity, San Diego, California, on two ratings. The objective of the study was to reduce petty officer billets in the upper grade levels,

<sup>12</sup> Rosicky, op. cit., p. 4.

<sup>13</sup> "Personnel Management Improvement and Quality Control," November 2, 1965 (in the files of the Task Force), p. 25.

The first of these is the fact that the  
 government has been unable to secure  
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### THE PROBLEM

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 pound sterling at its present level.

### THE SOLUTION

The solution is that the government  
 should be allowed to print money.



the assumption being that petty officer billets saved in one rating could be transferred to another more critical rating.<sup>14</sup>

The first rating chosen for examination was the Commissaryman (CS). According to the Manual of Qualifications for Advancement in Rating, the Commissaryman should be skilled in the preparation of food by the time he reaches E-5.<sup>15</sup> Above this grade, the billets should be of an administrative and supervisory nature. Therefore, those billets now established for E-6 and above in which the primary job is the preparation of food should be eliminated and more billets added at the E-5 level and below. In this manner, one would be equating job responsibility with job qualifications.<sup>16</sup>

With this in mind, billets both afloat and ashore were examined with the idea of restructuring. The table below illustrates a comparison of the present and revised Commissaryman requirements from grade level E-4 to E-7. There was an overabundance of billets at the higher grade levels

TABLE 3

## PRESENT AND REVISED COMMISSARYMAN REQUIREMENTS

CS Level	Present Requirements	Revised Requirements	Differences
C	1304	99	-1205
1	2532	553	-1979
2	3464	3765	+ 292
3	4324	5751	+1427
Total	11629	10168	-1461*

\*"Personnel Management Improvement and Quality Control," op. cit., p. 76.

<sup>14</sup>Ibid., p. 70.

<sup>15</sup>Manual of Qualifications for Advancement in Rating, op. cit., p. 70.

<sup>16</sup>"Personnel Management Improvement and Quality Control," op. cit., p. 71.





and insufficient billets in the lower grade levels. A further illustration is shown in Appendix A, Figure 1.

The second rating examined was the Fire Control Technician (FT), utilizing a slightly different approach. The various requirements for each job were examined, and the grade level of responsibility was equated to each job. There were limitations in examining certain areas and estimates were made. The table below compares the revised billet requirements and the present requirements.

TABLE 4

## FIRE CONTROL TECHNICIAN REQUIREMENTS

Pay Grade	Revised FT Rqts	Current Rqts (FY-66)	Current On Board (31 July 65)
E-9	53	94	127
E-8	153	295	286
E-7	790	890	1111
E-6	1557	2059	1130
E-5	2302	2274	1875
E-4	3052	2688	2773
Total	7912	8300	7302*

\*"Personnel Management Improvement and Quality Control," p. 103.

If the billets in every rating were analyzed, the Navy could better allocate the manpower available by eliminating unnecessary billets in some ratings and adding billets in those critical ratings where they are needed.

### Reenlistment Rate

The reenlistment rate is utilized as a measurement of how well or how poorly the Navy is doing in keeping men in the service. A high reenlistment rate would indicate that the Navy is doing well, and a low





reenlistment rate would indicate a high manpower turnover. Under close examination, one finds that the reenlistment rate is defined and computed in a very limited way. The four-year reenlistment rate is the number of men who actually reenlist at that point divided by the number of those eligible to reenlist. This does not include those men who reenlisted early or those not eligible to reenlist.<sup>17</sup>

In an attempt to make this rate more meaningful, an adjusted reenlistment rate is sometimes computed. The numerator and denominator of the rate are increased by adding those men who reenlisted early; however, this still does not convey a complete picture.<sup>18</sup>

The method by which an individual continues in the Navy is not as important as the fact that he does continue. The strength of a rating may be increased by early enlistments, conversions from one rating to another, and broken service enlistments. There may also be a subtraction from this strength by failure to reenlist, not being recommended for reenlistment, retirement, death or conversion to another rating.<sup>19</sup>

To determine how well a rating is meeting its manpower requirements, it is necessary to measure the total manpower flow in that rating. This would necessitate examining the percentage of the total number in any particular year group who continue on active duty into the next year. This percentage could be broken down by grade within each rating, which would allow a continuing examination of manpower flow through the billets in each grade in every rating. In this manner, one could forecast future needs

<sup>17</sup>Icdr. Gates, personal interview.

<sup>18</sup>Ibid.

<sup>19</sup>Ibid.



of manpower in each grade in every rating and allow for an early shifting of predicted excess manpower from one rating to another more critical rating.<sup>20</sup>

For example, one particular rating can be examined with respect to the men in this rating who have just completed their first four-year enlistment. To determine how many of these men the Navy would wish to "ship over," the forecasted manpower flow in each grade must first be examined. This would be dependent on a predetermined attrition rate and a predetermined promotion rate for the rating. The number of future billet vacancies in each grade could be approximated, and only the number required to eventually fill these billets would be "shipped over."

#### Pay

"The present system of military compensation was evolved by the Congress through evolutionary changes spanning a period nearly 200 years."<sup>21</sup> The Congress has responded to needs of the military as dictated by changes in political and technological situations. The enacting legislation has been tailored so that it could be applied with regard to needs of the service and economic resources of the nation. Because of the way in which it evolved, the military compensation system differs in many ways from the civilian compensation system.<sup>22</sup>

The military compensation system is not contained in one single statute or title of the United States code, but it is fragmented by many

<sup>20</sup> Ibid.

<sup>21</sup> Final Report to the Secretary of Defense by the U. S. Department of Defense Inter-Service Study Groups Appointed to Study Military Compensation, op. cit., p. 3-3.

<sup>22</sup> Ibid., pp. 3-3, 3-4.





laws. The "Career Compensation Act of 1949," which is the basic act for pay and allowances, has been amended by 41 separate statutes. It is further implemented by Executive Orders, Departmental Directives, and decisions by the Comptroller General. Because of these complexities, military compensation has been difficult to administer and confusing to understand.<sup>23</sup>

Compensation, when referring to salaries and wages, is usually defined as "any money, goods, service, or other benefit furnished to or received by a member for services rendered, whether immediately, contingently or on a deferred basis."<sup>24</sup> The military man's compensation has all the elements of the above definition to some degree as can be seen in the figure below.

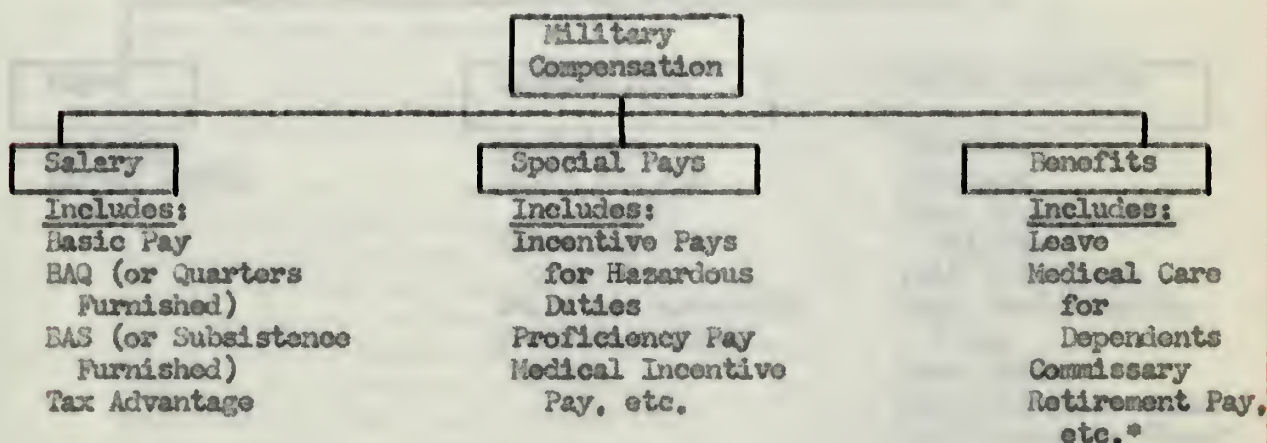


Figure 2

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\*Final Report to the Secretary of Defense by the U. S. Department of Defense Inter-Service Study Groups Appointed to Study Military Compensation, op. cit., p. 3-7.

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<sup>23</sup>Ibid., pp. 3-4, 3-5.

<sup>24</sup>Ibid., p. 3-5.





This wage package has been a tradition with the military man as a remuneration for the long hours on the job and hardships endured.

Since World War II, civilian industry has been rapidly adopting this package concept. From management, labor has negotiated contracts containing many of the fringe benefits that once exclusively belonged to the military. In fact, upon examination of the industrial compensation package, one finds very little difference from that of the military compensation package.

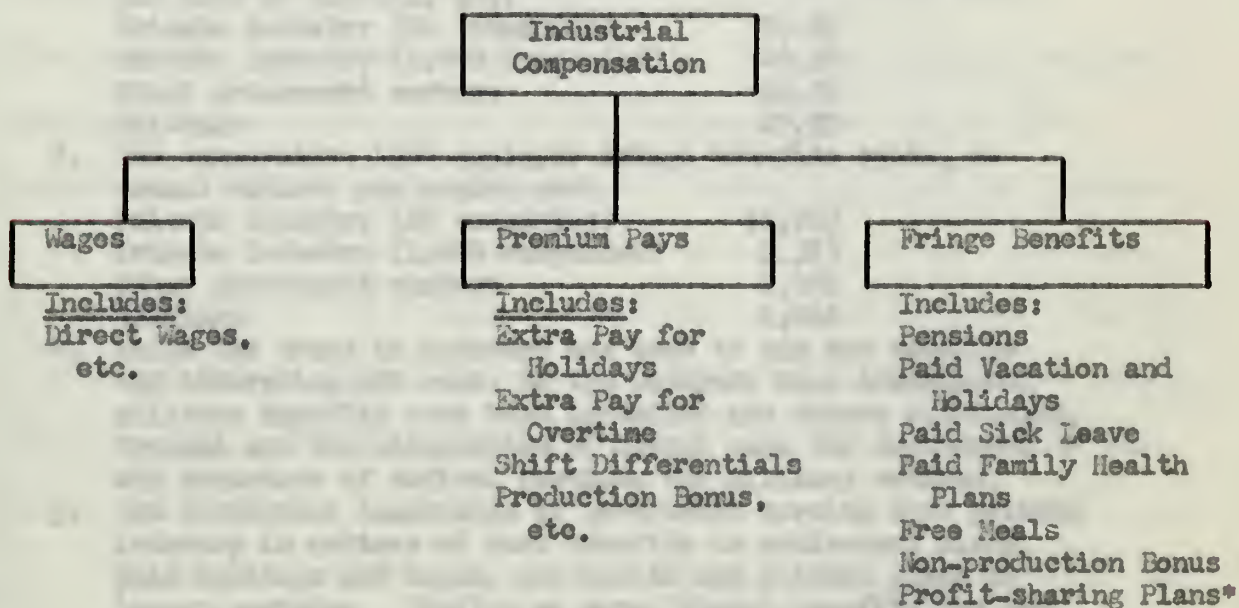


Figure 3

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\* Final Report to the Secretary of Defense by the U. S. Department of Defense Inter-Service Study Groups Appointed to Study Military Compensation, op. cit., p. 3-7.

To attempt to equate the military and civilian packages with respect to job responsibility, corresponding categories must be compared. The first category to be examined is one that has been a controversial topic since World War II -- fringe benefits. Fringe benefits are defined as "any wage cost not directly connected with employee productive effort,





performance, service, or sacrifice. They include payments for time not worked, payments for employee security and payments for employee services."<sup>25</sup>

A thorough study on fringe benefits was conducted in 1964 by the "Inter-Service Study Groups" for study of military compensation, and some of the conclusions arrived at were:

1. Military fringe benefits have not kept pace with the general trend in the U. S. economy. Private industry expenditures as percentage of gross payroll for fringe benefits have nearly doubled since World War II. Military benefits have remained virtually unchanged.
2. The comparative 1964 employer fringe benefits costs, as per cent of payroll, are:
 

Private Industry (86 companies)	28.8%
Private Industry (1,000 companies)	26.3%
Other government workers	22.3%
Military	27.9%
3. The comparative 1964 employer fringe benefits costs, as annual dollars per capita are:
 

Private Industry (86 companies)	\$1,725
Private Industry (1,000 companies)	1,515
Other government workers	1,460
Military	1,410
4. While the trend in industry has been to add new benefits and liberalize old ones, to the contrary some traditional military benefits have been curtailed and others eliminated. Typical are the elimination of dental care for dependents and reduction of medical services for military retired.
5. The historical leadership of government service over private industry in matters of such benefits as retirement plans, paid holidays and leave, and health and welfare plans no longer pertains. Similar or more liberal benefits are now available to large segments of the nation's industrial work force.<sup>26</sup>

Private industry has equaled or surpassed the military in this area, and fringe benefits can no longer be classified as a pay advantage for the military.

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<sup>25</sup>Ibid., p. 3.

<sup>26</sup>Ibid., p. 6-99.





The category on special or premium pay is received by only a small segment of the military and private industry as a whole. These are additional remunerations for specializations or additional labor performed over and above the norm. Consequently, a comparison cannot be made between the military and private industry since the benefit does not pertain to the entire population.

The final category contains salary and wages. "The parts of military compensation which should be related to the civilian salary structure are limited to basic pay, subsistence allowance, quarters allowance, and tax advantage accruing to military personnel as a result of the above allowances."<sup>27</sup> Examining an index comparing average earnings of enlisted personnel and production workers in manufacturing from 1955 to 1964 (Appendix A, Figure 4), one can see that enlisted wages have not increased at the same rate as those of production workers.<sup>28</sup> A further comparison of total earnings in the economy and enlisted basic pay increases from 1913 to 1963 (Appendix A, Figure 5) indicates that total earnings in the economy have increased to approximately twice that of enlisted basic pay for the same period.<sup>29</sup>

The present enlisted compensation system has not kept pace with the expanding economy; therefore, enlisted personnel are receiving wages which are well below the acceptable wage for comparable jobs in private industry.

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<sup>27</sup>Ibid., p. 5-46.

<sup>28</sup>Ibid., p. 3-21.

<sup>29</sup>Ibid.





### CHAPTER III

#### THE PROPOSED ADVANCEMENT SYSTEM

Again, we come to the Congress with emphasis on our foremost concern--people. . . . To retain as career people enough well trained and experienced personnel is difficult against the blandishments of civilian endeavor. Hopeful exhortation does not suffice to retain the ambitious, competent young men we need today. They must reason that the life of a civilian is more attractive than that of a serviceman, because I can assure you fine potential career talent is leaving the Navy in ever increasing numbers. . . . During 1964, 21,600 men possessing critical hard skills left the Naval Service. . . . Secretary Nitze spoke of the overall first term reenlistment rate declining from 25.3% to 20.1% today. Yet I'd like to note that in our Fleet Ballistic Missile program, where our men have more stabilized operations, assured periods of leave, generally better housing and more pay, the reenlistment rate is three times as high.<sup>1</sup>

It is with these thoughts in mind that this advancement system is proposed. The basic features of the system are to lengthen the time within each grade and the overall grade structure from E-2 to E-9 so that it will span a twenty-five year period. Within each grade will be step levels for pay increases which can be achieved by being recommended for and taking a technical exam which, if passed, will automatically give the man an increase in pay. To be recommended for the exam, a man must have reached a certain time in grade and also have demonstrated technical competence within his rating. The basic pay of the step levels within each grade will never exceed the minimum base pay of the next higher grade. A man can

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<sup>1</sup>Admiral McDonald, op. cit., p. 19.



only achieve the step level or levels that are within his present grade. If he becomes eligible for advancement to the next grade, he may take the exam and advance even though he has not achieved the step level in his present grade. In this case, his pay would automatically jump to the next higher grade.

The following is a diagram of the proposed system with regard to time:

<u>Pay Grade</u>	<u>Service Requirements</u>
E-1 to E-2	No specified time for advancement; may be effected upon completion of recruit training.
E-2 to E-3	9 months in pay grade E-2.
E-3 to SL1	1 year in pay grade E-3.
E-3 to E-4	2 years in pay grade E-3.
E-4 to SL2	18 months in pay grade E-4.
E-4 to E-5	3 years in pay grade E-4.
E-5 to SL3	18 months in pay grade E-5.
E-5 to SL4	3 years in pay grade E-5.
E-5 to E-6	4 years in pay grade E-5.
E-6 to SL5	2 years in pay grade E-6.
E-6 to SL6	4 years in pay grade E-6.
E-6 to E-7	5 years in pay grade E-6.
E-7 to SL7	2 years in pay grade E-7.
E-7 to SL8	4 years in pay grade E-7.
E-7 to E-8	5 years in pay grade E-7.
E-8 to SL9	2 years in pay grade E-8.
E-8 to SL10	4 years in pay grade E-8.
E-8 to E-9	5 years in pay grade E-8.

During recruit training, the enlisted man (E-1) is indoctrinated in the basic tenets of the Navy and is exposed to the occupations available to him while serving in the Navy. On completion of basic training, he is given a general knowledge exam which, if passed, automatically assures his promotion to grade E-2.

The proposed nine months spent as an E-2 will enable him to adapt to the military way of life and begin developing the skills needed for his selected occupation. The two means utilized by the Navy in developing these skills are service school training and on-the-job training.





At the completion of one year in service, the man should have completed his adjustment period and be well along in his development of the basic skills of the rating he is striking for. It is at this point that the minimum time for advancement to E-3 is proposed.

A man who has been working in the rating he is striking for should be proficient in the basic skills of this rating twenty-one months after completing basic training. The exceptionally skilled should receive some recognition, and it is proposed that a step level be included here. Therefore, those personnel who demonstrate competence in their skill could acquire an increase in pay after passing a technical exam.

To establish a quality career force, the first term enlistee must develop both in military discipline and technical skill. A sufficient period of time in which to gain experience within his job is required so that he can handle increased responsibilities in the future. He must also be allowed to mature and develop potentially useful qualities of leadership. A three year period of time should be sufficient for this purpose, and it is proposed that this be the minimum time for advancement to the petty officer grade of E-4.

An enlisted man who has achieved grade E-4 in three years will have one year of his first enlistment remaining in which to demonstrate the qualities and skills that he has developed. As a petty officer, he will be in a position to influence and guide those personnel under his authority. The remaining year should be a sufficient period for his superiors to observe his leadership qualities and technical ability and decide whether or not to "ship him over."

Those personnel who are "shipped over" will add to the career nucleus which the Navy needs to efficiently and effectively carry out its mission.





They will now follow an orderly progression of promotion, allowing enough time within each grade to acquire the experience necessary to carry out the responsibilities of the next higher grade. The step levels within these grades will enable the Navy to continue to give recognition to those men who demonstrate a high level of competence within their rating. These step levels will be based solely upon technical skill and will not carry with them an increase in military responsibility.

The grade structure of this system is graduated in such a manner to permit personnel to continually have a goal to strive for throughout their careers. This could preclude the loss of motivation and productivity which is characteristic of a system that permits promotion to its highest enlisted grade in a relatively short period of time.

Personnel advanced under the proposed system should have sufficient time in which to gain experience and develop the qualities of leadership necessary to become good leaders. A good leader can effectively guide and direct the men under his supervision and thereby gain their respect. With this respect could come the prestige which has so long been absent within the petty officer ranks.

#### Examinations

The examination system for advancement in rate would remain the same under the proposed system with the addition of technical examinations for step level advancement. The technical examinations would be compiled separately for each step level and would contain questions which pertain to the particular skill level to be attained at each step level. The examination would contain questions on only that area of a rating in which a man is required to have knowledge. It would be constructed centrally at





the United States Naval Examining Center, and when a man is recommended for the step level, the exam would be ordered by and sent to his local command. The man would automatically receive his step level promotion upon passing the exam since a quota system is not included for this advancement.

#### Pyramid Effect and Manpower Flow Rate

Every rating in the Navy has a required number of billets. The ideal billet structure for any one rating has a broad base of billets at the lower grade levels and a steady decrease of the total number of billets as the grade levels increase.<sup>2</sup> Ideally, this would form a pyramid; however, the shape of the pyramid would be different for each rating due to job requirements with respect to skill level and responsibility. A smooth manpower flow must be ensured through the billet structure of every rating in order to prevent stagnation. A continual forecasting of future manpower needs would be necessary at every grade level of every rating to maintain this flow.

To determine an accurate forecast, a rate of manpower flow through the billet structure of each rating should be established. The rate of flow would depend on the average time spent in-grade at each grade level and the ratio of billets from one grade level to the next higher grade level. To increase the accuracy of the manpower flow rate, a predetermined attrition rate should be added. This attrition rate should be composed of deaths, voluntary and involuntary releases, and conversions from one rating to another. With this manpower flow rate, one could theoretically

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<sup>2</sup> Lcdr. Gates, personal interview.





take the number of men in a specific rating by grade who were eligible to reenlist and choose the proper number to reenlist. The ideal time to use the manpower flow rate would be at the end of the first enlistment. One could theoretically retain the exact number of people to fill future needs based on the flow of manpower through the grade structure in the rating, and these men could expect to be promoted at the minimum time after passing the exam.

Theoretically, the manpower flow rate should work; but practically, it would need some assistance, which could be in the form of conversions from one rating to another and severance pay. A prime candidate for this should be a person who had exceeded the average time spent in-grade.<sup>3</sup> If it is determined that stagnation is beginning to occur at a grade level in a particular rating, the above mentioned personnel should be asked to convert to another rating that is less populous or be given the alternative of involuntary severance. It has been determined that the Navy could pay increasing amounts of severance pay for increasing lengths of time spent in the Navy and still spend less than it would cost to keep the man to retirement.<sup>4</sup> It is evident from examining column six of Table 5 in Appendix A that the Navy would only have to offer half that amount shown to provide adequate retention incentive.

The continuance rate is defined as the percentage of the total number in a particular year group who continue on active duty into the

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<sup>3</sup>"Personnel Management Improvement and Quality Control," op. cit., p. 39.

<sup>4</sup>Ibid.





next year.<sup>5</sup> For example, if there were 2,000 men in their fourth year of enlistment in 1965, and there were 1,000 men in their fifth year of service in 1966, the continuance rate from the fourth to the fifth year would be 50%. By using the continuance rate, the Navy would know the exact number of personnel that it retains from year to year in every rating. With this knowledge in mind and the knowledge of manpower flow through a particular rating and by use of the manpower flow rate, the Navy could determine future continuance rates and thereby better allocate its manpower resources.<sup>6</sup>

### Pay

Historically, every major study on military compensation has been accomplished with respect to the principle of comparability.<sup>7</sup> The term comparability is used to indicate that the principle of equal pay for equal work applies and should be utilized with respect to job performance and job evaluation.<sup>8</sup>

The "Hook Commission Report" in 1948 states:

The pay structure should offer initial compensation and progressive increases that compare with what a serviceman could expect in other professions and occupations requiring similar abilities. He should have as much opportunity to attain success as the man who chooses to enter private business. At the same time he must be assured of comparable

<sup>5</sup>Lcdr. Gates, personal interview.

<sup>6</sup>Ibid.

<sup>7</sup>Final Report to the Secretary of Defense by the U. S. Department of Defense Inter-Service Study Groups Appointed to Study Military Compensation, op. cit., p. 5-2.

<sup>8</sup>Ibid.

The first of these is the fact that the Commission has not yet received any information from the Government of the United Kingdom as to whether or not it is prepared to accept the Commission's findings. The second is the fact that the Commission has not yet received any information from the Government of the United Kingdom as to whether or not it is prepared to accept the Commission's findings. The third is the fact that the Commission has not yet received any information from the Government of the United Kingdom as to whether or not it is prepared to accept the Commission's findings.

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security. And with this assurance of equal opportunity with his civilian fellow citizen, he has an equal responsibility to support himself and his dependents and to participate in the cost of the government as a taxpayer.<sup>9</sup>

The purpose of developing a military wage scale that is comparable to those of Federal civil service and private industry is to:

1. Establish competitive income levels with similar occupational fields.
2. Provide equal recognition to the military professional, technical and labor forces.
3. Create a system of compensation which is readily comparable to systems in industry or other civilian enterprises.
4. Mechanize a compensation adjustment system in order to provide responsiveness and flexibility to meet changing compensation levels in the national economy.<sup>10</sup>

The first step in developing a wage scale for the military is to establish a standard for comparison. The equating of job responsibility between Federal civil service and the military should provide this standard. In May of 1964, a study on such a comparison was completed for the Department of Defense, and it was determined that there is a common standard between Federal civil service and the military. This standard is based on similar levels of duties, responsibilities and qualifications.<sup>11</sup>

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<sup>9</sup> Ibid., p. 5-3.

<sup>10</sup> Ibid., pp. 5-3, 5-4.

<sup>11</sup> Final Report to the Department of Defense by the Committee Appointed to Study the Federal Civilian-Military Linkage, May, 1964 (in the files of the Bureau of Naval Personnel), Abstract.





The grades that were equated in accordance with the above standard are shown below:

TABLE 6

## LINKAGE OF FEDERAL CIVIL SERVICE AND MILITARY

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<u>Military Rank</u>	<u>GS Grade Range</u>
E-9.....	7,9,11
E-8.....	7,8,9
E-7.....	7,9
E-6.....	7,9
E-5.....	4,5,6,7
E-4.....	3,4,5,7
E-3.....	3,4,5,12

---

The grades E-1 and E-2 were omitted since they are only suited to military organizations.

With the linkage of job responsibility established between the military and Federal civil service, a wage scale may now be formulated which would give the military a comparable wage and follow the principle of equal pay for equal work.

The following is a table comparing the present enlisted wage scale with the proposed wage scale. The proposed wage scale is based on the salary value of comparable Federal civil service grade levels.<sup>13</sup>

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<sup>12</sup> Ibid.

<sup>13</sup> Final Report to the Secretary of Defense by the U. S. Department of Defense Inter-Service Study Groups Appointed to Study Military Compensation, op. cit., p. 5-42.

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TABLE 7

## PRESENT AND PROPOSED MILITARY PAY SCALE

Present Military Pay Scale Includes base pay, BAQ, and subsistence			Proposed Pay Scale Includes increased base pay, same BAQ, and same subsistence			
Pay Grade	Longevity Step	Salary	Pay Grade	Longevity Step	Salary	Difference Between Systems
E-1	Under 2 yrs. 1 dependent	\$2,039	E-1	Under 2 yrs. 1 dependent	\$3,385	+\$1,296
E-2	Under 2 yrs. 1 dependent	2,240	E-2	Under 2 yrs. 1 dependent	4,197	+ 1,957
E-3	Under 2 yrs. 1 dependent	2,449	E-3	Under 2 yrs. 1 dependent	5,009	+ 2,560
			SL1	Under 2 yrs. 1 dependent	5,360	
E-4	3 yrs. with 2 dependents	3,828	E-4	3 yrs. with 2 dependents	5,711	+ 1,883
			SL2	4 yrs. 6 mo.	5,950	
E-5	6 yrs.	4,976	E-5	6 yrs.	6,189	+ 1,214
			SL3	7 yrs. 6 mo.	6,425	
E-6	8 yrs.	5,516	SL4	9 yrs.	6,661	+ 1,145
			E-6	10 yrs.	6,897	
E-7	12 yrs.	6,326	SL5	12 yrs.	7,133	+ 807
			SL6	14 yrs.	7,369	
			E-7	15 yrs.	7,605	
E-8	16 yrs.	7,342	SL7	17 yrs.	7,840	+ 498
E-9	18 yrs.	8,299	SL8	19 yrs.	8,075	- 224
E-9	20 yrs.	8,432	E-8	20 yrs.	8,310	- 122
E-9	22 yrs.	8,778	SL9	22 yrs.	8,780	+ 2
E-9	24 yrs.	8,778	SL10	24 yrs.	9,250	+ 472
E-9	25 yrs.	8,778	E-9	25 yrs.	9,485	+ 707
E-9	26 yrs.	9,456	E-9	26 yrs.	9,720	+ 264

To ensure that the military wage continues to keep pace with that of Federal civil service and private industry, it would be necessary for the Congress to enact legislation similar to the "Federal Salary Reform Act of 1962." The military would be provided with concrete wage guide lines and the wage scale could keep pace with our growing economy. President Kennedy realized that there was a growing need for such legislation



when he made the following statement at the White House signing of the "Military Pay Act of 1963."

In supporting this legislation before the Congress, this Administration pledged to use its best efforts to assure that in the future military compensation will keep pace with increases in salaries and wages in the civilian economy. I think that I speak on behalf of all of us when I say that it is a pledge that we intend to keep.<sup>14</sup>

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<sup>14</sup> U. S. President, 1961-63 (Kennedy), "Remarks to Guests Witnessing the Signing of the Military Pay Act of 1963," the White House, October 2, 1963, quoted in the Army, Navy, Air Force Journal and Register, October 12, 1963, p. 26.





## CHAPTER IV

### QUESTIONNAIRE SURVEY OF THE PROPOSED SYSTEM

A questionnaire was compiled concerning the proposal to investigate the desirability of the new advancement system. The investigation was accomplished in the form of a pilot study by taking a small segment of the Navy enlisted population and administering the questionnaire to this group.

The area chosen for investigation was the U. S. Naval Air Facility, Washington, D. C. Two major factors in the selection of the Naval Air Facility were its proximity and its broad distribution of ratings. From its complement of 904 enlisted men, a random sample of 250 men was taken. The sample, obtained through the personnel officer of the Facility, was selected by taking a proportionate amount of personnel from the available departments. The sample was broken down into five groups and the questionnaire was administered to these groups, one at a time, over a period of two days.

The proposed system was thoroughly explained to each group and the men were given the opportunity to ask any clarifying questions. The system was also written on the first page of the questionnaire for reference purposes.

Of the sample of 250 men, one man did not complete the questionnaire. Each session was controlled so that adequate time was given for each man to think about the questions before selecting his choice of answers.





It has been determined that no single factor, but a combination of several factors, explains why the Navy is having difficulty retaining its highly skilled personnel. The factors which were taken into consideration in this project were prestige, status, and pay. The questionnaire was constructed to include questions concerning these factors. Ambiguity, stereotyped responses, cliché answers, and loaded words were avoided.

The questionnaire was of the structured type; however, a number of the questions contained space for comments. The questions were structured in such a manner as to facilitate ease in handling and tallying the data.

The following is a distribution of respondents by grade:

Grade	Number	Per Cent
E-9	2	0.8
E-8	2	0.8
E-7	8	3.2
E-6	37	14.9
E-5	47	18.8
E-4	60	24.1
E-3	41	16.5
E-2	52	20.9
Total	249	100.0

The first condition is that the system must be in a state of equilibrium. This means that the system must be at rest and there must be no net force acting on it. The second condition is that the system must be rigid. This means that the shape and size of the system must not change. The third condition is that the system must be homogeneous. This means that the material must be the same throughout. The fourth condition is that the system must be isotropic. This means that the properties must be the same in all directions. The fifth condition is that the system must be continuous. This means that there must be no gaps or discontinuities in the material. The sixth condition is that the system must be perfectly elastic. This means that the system must return to its original shape and size after being deformed. The seventh condition is that the system must be perfectly plastic. This means that the system must not return to its original shape and size after being deformed. The eighth condition is that the system must be perfectly brittle. This means that the system must break without any plastic deformation. The ninth condition is that the system must be perfectly ductile. This means that the system must be able to undergo large plastic deformations without breaking. The tenth condition is that the system must be perfectly strong. This means that the system must be able to withstand large forces without failing.

Material	Young's Modulus (GPa)	Poisson's Ratio
Steel	200	0.3
Aluminum	70	0.33
Copper	110	0.34
Brass	100	0.35
Iron	210	0.28
Gold	120	0.42
Silver	100	0.37
Platinum	160	0.39
Palladium	130	0.41
Nickel	200	0.31

Questionnaire

1. Your present grade and rating. \_\_\_\_\_
2. Time in present grade. \_\_\_\_\_
3. Time in the Navy. \_\_\_\_\_
4. Are you making the Navy your career? \_\_\_\_\_
5. The proposal's major concept is to promote men to higher petty officer grades on a basis of leadership ability as well as technical skill and to advance men to higher pay levels within grade based on technical ability.

Definitely  
in favorSomewhat  
in favorIndifferent  
NeutralSomewhat  
opposedDefinitely  
opposed

Comments. \_\_\_\_\_

6. How do you feel about the length of time for advancement in-grade under the present system:

	Too Short	About Right	Too Long
From E-2 to E-3	_____	_____	_____
From E-3 to E-4	_____	_____	_____
From E-4 to E-5	_____	_____	_____
From E-5 to E-6	_____	_____	_____
From E-6 to E-7	_____	_____	_____
From E-7 to E-8	_____	_____	_____
From E-8 to E-9	_____	_____	_____

Comments. \_\_\_\_\_

7. How do you feel about the length of time for advancement in-grade under the proposed system:

	Too Short	About Right	Too Long
From E-2 to E-3	_____	_____	_____
From E-3 to E-4	_____	_____	_____
From E-4 to E-5	_____	_____	_____





7. continued	Too Short	About Right	Too Long
From E-5 to E-6	_____	_____	_____
From E-6 to E-7	_____	_____	_____
From E-7 to E-8	_____	_____	_____
From E-8 to E-9	_____	_____	_____

Comments: \_\_\_\_\_

8. What effect do you feel the proposed advancement system would have on:

	Improve	Remain Same	Get Worse
morale	_____	_____	_____
leadership ability	_____	_____	_____
supervisory ability	_____	_____	_____
productive motivation	_____	_____	_____
career retention	_____	_____	_____
prestige of petty officer	_____	_____	_____
discipline	_____	_____	_____
respect for the petty officer	_____	_____	_____

Comments: \_\_\_\_\_

9. The reason most men want to advance in-grade is for the increase in status.

Strongly agree      Agree      Disagree      Strongly disagree

10. The reason most men want to advance in-grade is for additional pay.

Strongly agree      Agree      Disagree      Strongly disagree

11. Real status begins with:

E-4              E-5              E-6              E-7              E-8              E-9

12. I feel that each grade has the prestige that it deserves.

Strongly agree      Agree      Disagree      Strongly disagree





13. Do you feel that a graduated increase of pay within grade would be a better incentive to "ship-over" than the variable "shipping-over" bonus presently in use?

14. Do you feel that the variable "shipping-over" bonus retains people who are more impressed with the amount of the bonus than they are interested in a career in the Navy?



## CHAPTER V

### ANALYSIS OF THE SURVEY

To properly analyze the acceptability within the enlisted ranks of the proposed advancement system, a survey in the form of a questionnaire was conducted. The questions pertained to variables which were related to both the present and proposed systems. By examining the opinions of a sample of enlisted personnel with respect to these variables, it was believed that the effect that each system would have on the variables could be determined. In this manner, a judgment could then be made as to what merit the proposed system would have compared to the present system in helping the Navy retain competent and highly skilled personnel.

The first three questions were of a general nature covering present grade and rating, time in present grade, and time in the Navy, respectively. The fourth question was concerned with the number of people who are making or planning to make the Navy a career. Of the sample, 44.9% indicated that they do not plan to make a career of the Navy. Of the men in their first term of enlistment (E-4 and below), over 50% definitely are not career-minded, and approximately 30% are undecided at this time (Appendix B, Table 1). It is readily apparent that many skilled personnel in this sample will be lost before the Navy realizes a satisfactory return on its investment in these men.





The fifth question dealt with the proposal's major concept--to promote men to higher petty officer grades on a basis of leadership ability as well as technical skill and to advance men to higher pay levels within grade based on technical ability. To some degree, 69.2% were in favor of this concept as compared to 16% who were opposed to it. Since only 4.4% of the sample were definitely opposed, 95.6% saw some merit in the concept (Appendix B, Table 2).

The sixth question was concerned with opinions with respect to the length of time for advancement in-grade under the present system. Each grade was presented separately to obtain any variation in opinions between lower and higher grades. A definite majority was of the opinion that the entire present promotion system with respect to time is favorable (Appendix B, Tables 3-9). Approximately 30% felt that the time periods for promotion to grades E-4 and E-5 are too short. These opinions were distributed evenly throughout the grades. Both grades E-4 and E-5 may be achieved in the first enlistment and the above indicates that there are a fair number of people who are of the opinion that perhaps personnel achieve these grades before they have the experience which is needed to assume this level of responsibility.

The seventh question dealt with the length of time for advancement in-grade under the proposed system. Each grade was again presented separately to obtain any variation in opinions between lower and higher grades. With respect to advancement to grade E-3, 58.3% expressed the opinion that the length of time for advancement under the proposed system is adequate as compared to 29.3% who felt that it is too long. (Appendix B, Table 10). The majority of those who expressed the opinion that the time period is too long were in the lower grades.





The opinion was expressed by 47.4% of the sample that the length of time for advancement to E-4 under the proposed system is adequate as compared to 43.4% who indicated that it is too long (Appendix B, Table 11). The majority of those who expressed the opinion that the time period is too long were in grades E-2 and E-3.

The opinions for grades E-5 through E-9 were evenly distributed between adequate and too long with the advantage going to those who indicated too long (Appendix B, Tables 12 through 16); therefore, no significant conclusion can be drawn for these grades.

Comparing the opinions given with respect to time in-grade for the proposed system with those in the present system, it becomes apparent that many of those who indicated adequate for time in grade for the proposed system also gave the same response for the present system. Consequently, it can be concluded that either these respondents did not understand the two questions, or that they became biased with respect to the proposed system after examining the wage scale which is associated with it.

Question eight listed several variables and the effect that the proposed advancement system would have on these variables. The majority felt that the following variables would improve under the proposed system: morale, leadership, supervisory ability, productive motivation, career retention, prestige, and respect (Appendix B, Tables 17 through 24). The chief petty officers (E-7, E-8, E-9) indicated a high majority in the opinion that productive motivation and career retention would improve.

Concerning discipline, 47% felt that it would improve under the proposed system and 45% indicated that it would remain the same (Appendix B, Table 23).





Item nine on the questionnaire stated that the reason most men want to advance in-grade is for the increase in status. Of the respondents, 65.8% favored this opinion to some degree (Appendix B, Table 25).

Item ten stated that the reason most men want to advance in grade is for additional pay. An overwhelming majority of 94% favored this opinion (Appendix B, Table 26).

Item eleven asked the respondents in which grade real status begins. The majority of the opinions were evenly distributed among grades E-5, E-6, and E-7 with the other grades receiving a substantially smaller vote (Appendix B, Table 27). Only 14.9% of the respondents indicated that the petty officer grade of E-4 has any status. In fact, from the conclusion drawn above, there was a definite diversification of opinion to the grade where real status does begin. Looking back at the responses to item nine, it is obvious that most respondents are aware of status and want to advance to increase their status. It could be concluded that the present advancement system does not offer the necessary time to develop the experience and maturity needed to command a recognition of status at the lower petty officer levels. Time is considered to be a definite factor since the respondents were of the opinion in item eight that an increase in time would improve leadership ability, supervisory ability, prestige, and respect—all characteristics of the measurement of status in a grade.

To further justify the above conclusion, 67.5% of the respondents to item twelve disagreed to some degree with the statement that each grade has the prestige it deserves (Appendix B, Table 28).





Question thirteen dealt with a graduated increase in pay as opposed to a variable "shipping-over" bonus presently in use as a better incentive for reenlistment. Of the respondents, 52.3% favored the graduated increase in pay compared to 34.9% who favored a variable "shipping-over" bonus (Appendix B, Table 29). The upper grades favored the graduated pay increase and the lower grades favored the bonus. The conclusion that can be drawn is that younger men are apparently more attracted to lump sum cash payment, and older men are more interested in a larger pay on a daily basis.

In question fourteen, 66.3% favored the opinion that the variable "shipping-over" bonus retains people who are more impressed with the amount of money offered than with the idea of making a career of the Navy (Appendix B, Table 30). The bonus is designed to retain first term enlistees--people in the lower grades. A definite relationship exists between the opinions of this question and question thirteen in which the lower grades favored the bonus. The conclusion could perhaps be drawn that many of the young men who favor this bonus are, in fact, "shipping-over" because of the money and, therefore, may not do the job as efficiently as those who "ship-over" because they like the Navy. Those people who "ship-over" because of the money may eventually feel that they have too much time in service to terminate their service and would continue in a career that does not satisfy them.

From this analysis, one can conclude that enlisted men in the sample are interested in an advancement system which will provide them with petty officers who have the leadership ability and technical skills which are commensurate with the responsibilities of each grade level.





They are also interested in a system which provides them with an increase in status and prestige at each increase in-grade and a wage scale that is commensurate with job responsibility. It is apparent that they are of the opinion that a longer period spent at each grade level would provide the Navy with such a system; however, at least half of the respondents are unreceptive to a lengthening of the time within each grade to the extent of the proposed advancement system. This could be due to the fact that stagnation has occurred in a number of ratings at various grade levels, and there are long periods of time between advancement. This, along with the present wage scale, causes hardship on them and their families, and any increases in minimum time for advancement becomes unacceptable.

The general reaction by the sample to the proposal in its entirety was favorable; however, there was considerable objection to the minimum time for advancement to grades E-5 through E-9 under the proposed system.

The subject of the present paper is the question of the possibility of a general theory of the structure of the universe. The question is whether it is possible to find a general theory of the structure of the universe which is valid for all cases. The answer is that it is not possible to find a general theory of the structure of the universe which is valid for all cases. The reason for this is that the structure of the universe is too complex to be described by a single theory. The structure of the universe is determined by many factors, including the distribution of matter and energy, the curvature of space, and the expansion of the universe. These factors are all interrelated and their effects are not always predictable. Therefore, it is not possible to find a general theory of the structure of the universe which is valid for all cases.

The question of the possibility of a general theory of the structure of the universe is a very important one. It is one of the most fundamental questions in cosmology and it has been the subject of much research and discussion.

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## CHAPTER VI

### SUMMARY AND CONCLUSIONS

The technological explosion of recent years has caused a vast change in the concepts of warfare. The mission of the Navy has taken on new meaning and the weapons to complete this mission have grown in number and complexity. To carry out this mission and to maintain these weapon systems, the Navy has expanded its forces and has molded them into a highly skilled and efficient fighting team.

A major challenge facing the Navy today is to keep this highly skilled and efficient fighting team "intact". Many of its skilled personnel are leaving the service for more attractive jobs in civilian industry and in Federal civil service. Positions in these industries offer more status and a higher wage scale. Prolonged separations from families and adverse living conditions lessen the attractiveness of a Navy career. Benefits which were previously enjoyed by the military have not kept pace with our rapidly expanding economy, and private industry and Federal civil service have either equaled or surpassed these benefits. On examining wage scales for comparable job responsibilities between private industry, Federal civil service, and the military, one finds that the military lags far behind in this area.

The Navy has not been realizing a fair return on its investment in the initial four-year enlistment. To train a skilled technician requires many months of schooling and on-the-job training. By the time a



The first of these is the fact that the journal is a new venture. It is a new venture in the sense that it is a new publication, and it is a new venture in the sense that it is a new publication. The second of these is the fact that the journal is a new venture. It is a new venture in the sense that it is a new publication, and it is a new venture in the sense that it is a new publication. The third of these is the fact that the journal is a new venture. It is a new venture in the sense that it is a new publication, and it is a new venture in the sense that it is a new publication.

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man acquires the skill and experience necessary to do his job properly, half of his enlistment is finished. At the end of four years, private industry is ready to offer this man far more than the Navy can offer him. As a result, many of these men leave the military for better positions in private industry.

In an attempt to counter this exodus of its highly skilled and competent personnel and to make the service more attractive as a career, the Navy utilizes a rapid promotion system. This system allows personnel to be promoted rapidly in the first term of enlistment and to reach positions of responsibility in a short span of time. By being promoted rapidly, these personnel do not have a sufficient period of time in which to develop the experience and maturity which are commensurate with the skills and leadership these positions of responsibility entail. Because of this, authority and responsibility previously delegated to these enlisted positions have been centralized within the commissioned officer ranks. As a result, the status and prestige previously enjoyed by petty officers has deteriorated considerably.

The present advancement system does not meet the challenge which faces the Navy today. Rapid promotion has caused many of our ratings to become stagnant at various grade levels. To alleviate this problem, billets have been added at these levels which, in turn, caused an over-population in many ratings. Over-population and stagnation does not present an attractive career incentive to a man who is just finishing his first term of enlistment.

In an attempt to find a solution to the Navy's retention problem, a study was conducted on the advantages and disadvantages of a new type of enlisted advancement system. The entire structure is proposed to be





spaced over a period of twenty-five years so that a man will be able to continue to advance to higher levels throughout his career. This system proposes to expand the length of time spent within each grade to give a man the opportunity to gain additional experience before he has to assume the responsibilities of a higher grade. Within each grade, step levels are proposed, similar to those in the Federal civil service, at which point a man can achieve a pay increase based on his technical skill. The system proposes to have a wage scale which is comparable to the same levels of responsibility in private industry.

A survey was conducted with regard to the proposed system in which a sample of 250 enlisted personnel completed a questionnaire concerning both the present and proposed advancement systems. After analyzing the questionnaires, it was concluded that enlisted men are interested in an advancement system which will provide them with petty officers who have the leadership ability and technical skills which are commensurate with the responsibilities of each grade level. Furthermore, they are interested in a system which provides them with an increase in status and prestige at each level of advancement and a wage scale which is commensurate with job responsibility.

The majority of the respondents stated that the minimum time for advancement to each grade under the present system is adequate. With respect to the proposed system, the majority of respondents stated the opinion that the minimum time for advancement to grades E-2 through E-4 is adequate; however, for grades E-5 through E-9, opinions were almost equally distributed between the time being adequate and too long.

The majority of respondents felt that the status and prestige of the petty officer is not what it should be. They felt that the proposed



system would improve this by improving leadership ability, supervisory ability, prestige, and respect. They were also of the opinion that the proposed system would improve retention.

The pay scale of the proposed system presents a wage which is comparable to job responsibility in private industry and Federal civil service. The majority of the respondents favored the opinion that such a wage scale would be more advantageous than a "shipping-over" bonus and would allow them to assume a standard of living comparable to their civilian counterpart in our growing economy.

From this pilot study, it is concluded that the proposed system would encourage the retention of highly skilled personnel by offering them a wage scale commensurate with their job responsibility and the status and prestige befitting their position. Therefore, it is recommended that further study be conducted to determine the feasibility of adopting the proposed advancement system by the military services.





## APPENDIX A





TABLE 1\*

# LEVELS OF COMPETENCE ATTAINED BY SONAR TECHNICIANS DURING A FOUR YEAR ENLISTMENT

## Column Definitions:

1. Months of Service
2. Advancement in Rating (Times shown are the minimum number of months required to become eligible for advancement to the next rate. Since advancement examinations are given but twice a year, only a few advancements coincide with the time scale given.)
3. Status
4. Level of Competence

1	2	3	4
3 mos.	Enters Navy as SR	Trainee and Travel (3 mos.)	Attending recruit school (11 weeks)
6 mos. 9 mos.	Advances to SA	Trainee and Travel (7 mos.)	Attending SO A School (23 to 31 weeks). Length depends on whether ship or submarine designated and on the location of course. In addition to operator skills and procedures, he learns some basic electronics and how to perform preventive maintenance.
12 mos. 15 mos.	Advances to SN	Novice (12 mos.)	Reports to ship. May spend first few months performing mess-cooking or other nonrating-connected details. He needs OJT under competent guidance to develop skill in equipment operation and maintenance.
18 mos. 21 mos.	Advances to SO3		

\* Rosicky, op. cit., pp. 25-26.

# REPORT ON THE PROGRESS OF THE WORK DURING THE YEAR 1961

1. Introduction

2. Objectives of the work

3. Results of the work

4. Conclusions

1	2	3	4
1.1. General description of the work	1.2. Objectives of the work	1.3. Results of the work	1.4. Conclusions
1.1.1. General description of the work	1.2.1. Objectives of the work	1.3.1. Results of the work	1.4.1. Conclusions
1.1.2. General description of the work	1.2.2. Objectives of the work	1.3.2. Results of the work	1.4.2. Conclusions
1.1.3. General description of the work	1.2.3. Objectives of the work	1.3.3. Results of the work	1.4.3. Conclusions
1.1.4. General description of the work	1.2.4. Objectives of the work	1.3.4. Results of the work	1.4.4. Conclusions
1.1.5. General description of the work	1.2.5. Objectives of the work	1.3.5. Results of the work	1.4.5. Conclusions
1.1.6. General description of the work	1.2.6. Objectives of the work	1.3.6. Results of the work	1.4.6. Conclusions
1.1.7. General description of the work	1.2.7. Objectives of the work	1.3.7. Results of the work	1.4.7. Conclusions
1.1.8. General description of the work	1.2.8. Objectives of the work	1.3.8. Results of the work	1.4.8. Conclusions
1.1.9. General description of the work	1.2.9. Objectives of the work	1.3.9. Results of the work	1.4.9. Conclusions
1.1.10. General description of the work	1.2.10. Objectives of the work	1.3.10. Results of the work	1.4.10. Conclusions

1.11. General description of the work

TABLE 1--Continued

1	2	3	4
24 mos. 27 mos.		Operator and Maintainer (6 mos.)	Can operate and perform preventive maintenance on his equipment. Needs only limited supervision. May attend technical maintenance course on a specific equipment as soon as he advances to 302.
	Advances to 502	Trainee and Travel (2 mos.)	Attending Class C maintenance course on specific equipment (6 to 10 weeks)
30 mos. 33 mos. 36 mos. 39 mos.		Operator and Novice Technician (12 mos.)	Returns to ship where he needs appropriate guidance during time it takes to develop confidence and competence in his equipment maintenance, troubleshooting, and repair responsibilities. Also becomes a better operator and maintainer as a result of the course.
42 mos. 45 mos. 48 mos.		Operator and Technician (6 mos.)	Becomes qualified to technically maintain his equipment. If he reenlists, needs and is normally sent to SO B School to improve his technical background.





TABLE 2

## FIRST TERM REENLISTMENT FIGURES BY RATING\*

## Column Definitions:

1. Relative Standing
2. Rate Abbreviation
3. Separations Eligible to Reenlist
4. No. Reenlisted
5. Reenlistment Rate

Note: Cumulative 1 July 1964 through 30 June 1965

1	2	3	4	5
1	BR	2	2	100.0
2	SD	127	126	99.2
3	MT	361	192	53.2
4	CS	969	354	36.5
5	TD	122	44	36.1
6	TM	677	237	35.0
7	AZ	141	47	33.3
8	DS	53	17	32.1
9	DK	281	90	32.0
10	CY	1868	564	30.2
11	PR	208	62	29.8
12	PN	954	282	29.6
13	EO	147	43	29.3
14	CT	1098	318	29.0
15	PT	56	16	28.6
16	UT	73	22	28.2
17	HM	1690	459	27.2
18	MN	59	16	27.1
19	MA	332	90	27.1
20	FT	1906	499	26.2
21	PH	404	105	26.0
22	BM	1573	402	25.6
23	AC	304	77	25.3
24	AK	493	122	24.7
25	SK	1447	353	24.4
26	SH	414	101	24.4

\*Rosicky, op. cit., pp. 22-23.





TABLE 2--Continued

1	2	3	4	5
27	CM	109	26	23.9
28	MM	3955	924	23.4
29	EN	1993	450	22.6
30	AX	436	98	22.5
31	ET	3423	768	22.4
32	BU	267	53	21.7
33	MU	326	72	22.1
34	AQ	436	96	22.0
35	AO	874	191	21.9
36	DT	277	60	21.7
37	GM	1132	246	21.7
38	ST	1012	218	21.5
39	QM	778	164	21.1
40	AM	1925	401	20.8
41	JO	127	26	20.5
42	DM	134	27	20.1
43	DC	453	91	20.1
44	AD	3010	600	19.9
45	AT	1890	373	19.7
46	EM	2486	487	19.6
47	SM	678	130	19.2
48	RM	3470	664	19.1
49	IC	1436	265	18.5
50	CE	147	32	18.4
51	SF	1333	237	17.8
52	AB	1133	199	17.6
53	EA	46	8	17.4
54	AE	1250	210	16.8
55	BT	2378	335	16.2
56	PC	253	40	15.8
57	SW	108	17	15.7
58	LI	84	13	15.5
59	AG	321	46	14.3
60	PM	28	4	14.3
61	IM	48	6	12.5
62	RD	2001	233	11.6
63	OM	67	7	10.4
64	ML	48	5	10.4
65	MR	471	46	9.8
Overall Navy (includes general rates)		74224	15873	21.4



# COMMISSARYMAN (CS) RATING\*

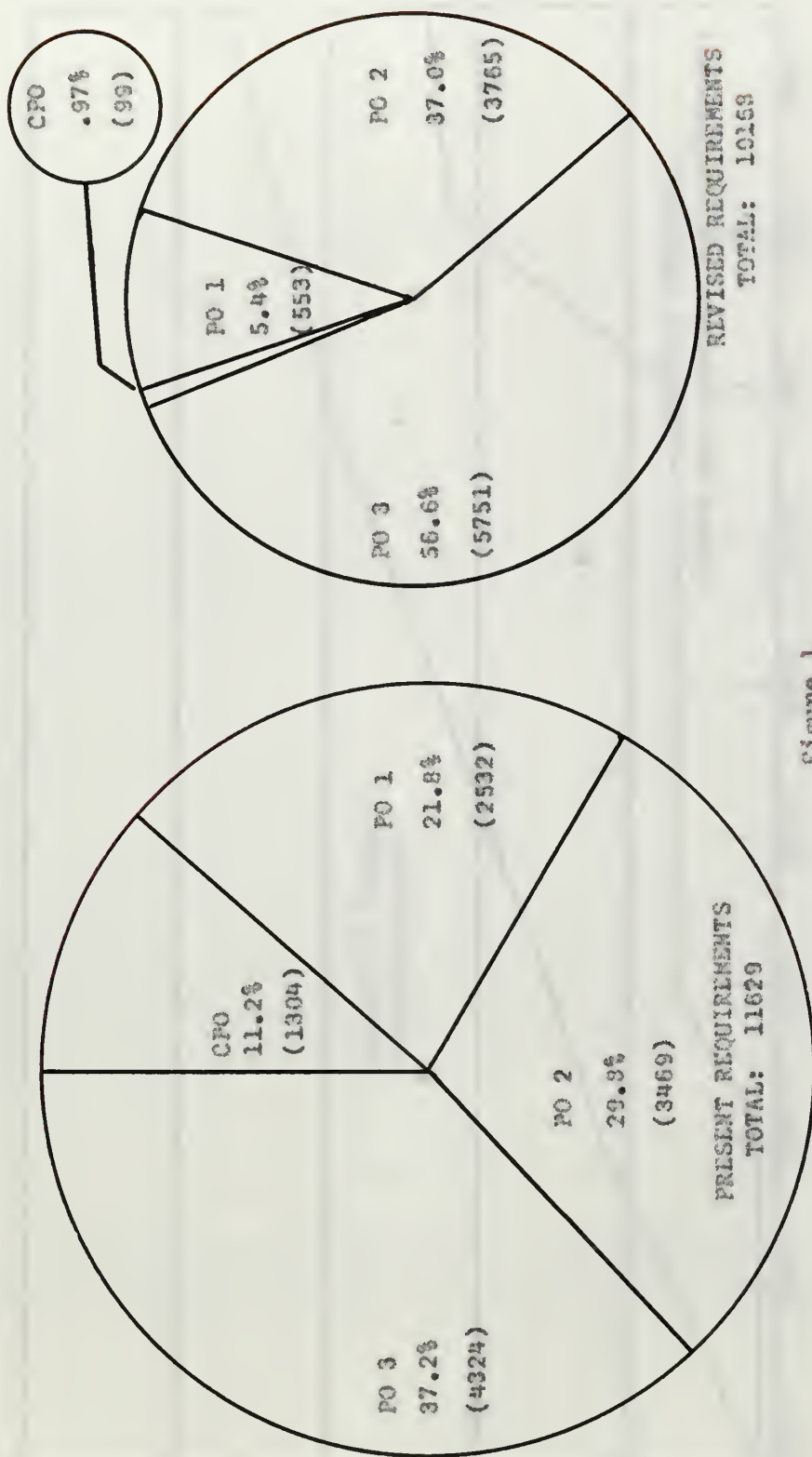


Figure 1

\* Personnel Management Improvement and Quality, op. cit., p. 78.





# INDEX OF AVERAGE EARNINGS ENLISTED\*

1955 = 100

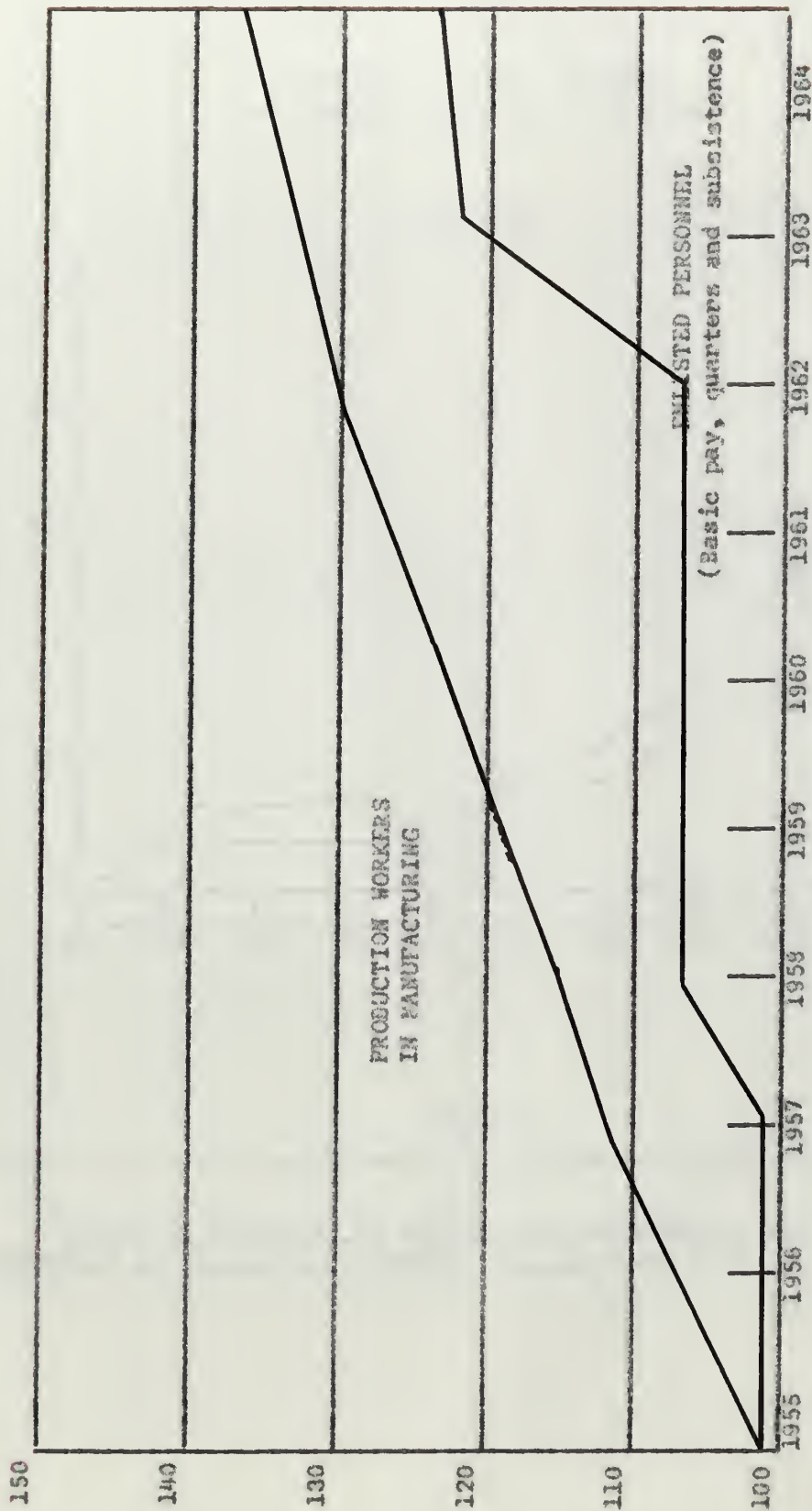


Figure 4

\* Report to Secretary of Defense on Professional and Technical Compensation for Military Personnel, op. cit., p. 3-35.





Comparison of Total Earnings  
And Enlisted Basic Pay Increases\*



Figure 5

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\* Report to Secretary of Defense on Professional and Technical Compensation for Military Personnel, *op. cit.*, p. 3-38.



TABLE 5

## OPPORTUNITY COST OF EARLY RETIREMENT\*

Longevity Year	Present Value of Retirement Annuity Sum at 20th Year	Probability of Retirement	Probable Sum/Man	Present Value at 5%	Maximum Opportunity Cost of Early Retirement	Percent of Retirement Annuity Present Value
0	\$ 46,500	.121	\$ 5,627	.396	\$ 2,228	4.79%
1	46,500	.126	5,859	.416	2,437	5.24%
2	46,500	.133	6,185	.436	2,697	5.80%
3	46,500	.173	8,045	.458	3,685	7.92%
4	46,500	.519	24,134	.481	11,608	24.96%
5	46,500	.560	26,040	.505	13,150	28.27%
6	46,500	.560	26,040	.530	13,801	29.67%
7	46,500	.596	27,714	.557	15,437	33.19%
8	46,500	.617	28,691	.585	16,784	36.09%
9	46,500	.665	30,923	.614	18,987	40.83%
10	46,500	.708	32,922	.645	21,235	45.66%
11	46,500	.733	34,085	.676	23,041	49.55%
12	46,500	.761	35,387	.711	25,160	54.10%
13	46,500	.786	36,549	.746	27,266	58.63%
14	46,500	.807	37,526	.784	29,420	63.26%
15	46,500	.823	38,270	.823	31,496	67.73%
16	46,500	.840	39,060	.864	33,748	72.57%
17	46,500	.852	39,618	.907	35,934	77.27%
18	46,500	.917	42,641	.952	40,594	87.29%
19	46,500	1.000	46,500	1.000	46,500	100.00%
20	46,500	1.000	46,500	1.000	46,500	100.00%

\*Personnel Management and Quality Control," op. cit., p. 39.





APPENDIX B

RESPONSES TO THE QUESTIONNAIRE





Item 4. Are you making the Navy your career?

TABLE 1

## DISTRIBUTION OF RESPONSES TO MAKING THE NAVY A CAREER

Grade	No.	Yes	No	Undecided
E-9	2	0.0%	0.0%	100.0%
E-8	2	100.0%	0.0%	0.0%
E-7	8	100.0%	0.0%	0.0%
E-6	37	78.4%	13.5%	8.1%
E-5	47	40.4%	27.7%	31.9%
E-4	60	21.7%	55.0%	23.3%
E-3	41	7.3%	63.4%	29.3%
E-2	52	1.9%	67.4%	30.7%
Total Sample	249	30.2%	44.9%	24.9%

## TABLE I

Table I. Total and Average for the State and for the Districts

Year	Total	Average	State	Districts
1890	100	100	100	100
1891	100	100	100	100
1892	100	100	100	100
1893	100	100	100	100
1894	100	100	100	100
1895	100	100	100	100
1896	100	100	100	100
1897	100	100	100	100
1898	100	100	100	100
1899	100	100	100	100
1900	100	100	100	100
1901	100	100	100	100
1902	100	100	100	100
1903	100	100	100	100
1904	100	100	100	100
1905	100	100	100	100
1906	100	100	100	100
1907	100	100	100	100
1908	100	100	100	100
1909	100	100	100	100
1910	100	100	100	100
1911	100	100	100	100
1912	100	100	100	100
1913	100	100	100	100
1914	100	100	100	100
1915	100	100	100	100
1916	100	100	100	100
1917	100	100	100	100
1918	100	100	100	100
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1920	100	100	100	100
1921	100	100	100	100
1922	100	100	100	100
1923	100	100	100	100
1924	100	100	100	100
1925	100	100	100	100
1926	100	100	100	100
1927	100	100	100	100
1928	100	100	100	100
1929	100	100	100	100
1930	100	100	100	100
1931	100	100	100	100
1932	100	100	100	100
1933	100	100	100	100
1934	100	100	100	100
1935	100	100	100	100
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1991	100	100	100	100
1992	100	100	100	100
1993	100	100	100	100
1994	100	100	100	100
1995	100	100	100	100
1996	100	100	100	100
1997	100	100	100	100
1998	100	100	100	100
1999	100	100	100	100
2000	100	100	100	100
2001	100	100	100	100
2002	100	100	100	100
2003	100	100	100	100
2004	100	100	100	100
2005	100	100	100	100
2006	100	100	100	100
2007	100	100	100	100
2008	100	100	100	100
2009	100	100	100	100
2010	100	100	100	100
2011	100	100	100	100
2012	100	100	100	100
2013	100	100	100	100
2014	100	100	100	100
2015	100	100	100	100
2016	100	100	100	100
2017	100	100	100	100
2018	100	100	100	100
2019	100	100	100	100
2020	100	100	100	100
2021	100	100	100	100
2022	100	100	100	100
2023	100	100	100	100
2024	100	100	100	100
2025	100	100	100	100
2026	100	100	100	100
2027	100	100	100	100
2028	100	100	100	100
2029	100	100	100	100
2030	100	100	100	100
2031	100	100	100	100
2032	100	100	100	100
2033	100	100	100	100
2034	100	100	100	100
2035	100	100	100	100
2036	100	100	100	100
2037	100	100	100	100
2038	100	100	100	100
2039	100	100	100	100
2040	100	100	100	100
2041	100	100	100	100
2042	100	100	100	100
2043	100	100	100	100
2044	100	100	100	100
2045	100	100	100	100
2046	100	100	100	100
2047	100	100	100	100
2048	100	100	100	100
2049	100	100	100	100
2050	100	100	100	100
2051	100	100	100	100
2052	100	100	100	100
2053	100	100	100	100
2054	100	100	100	100
2055	100	100	100	100
2056	100	100	100	100
2057	100	100	100	100
2058	100	100	100	100
2059	100	100	100	100
2060	100	100	100	100
2061	100	100	100	100
2062	100	100	100	100
2063	100	100	100	100
2064	100	100	100	100
2065	100	100	100	100
2066	100	100	100	100
2067	100	100	100	100
2068	100	100	100	100
2069	100	100	100	100
2070	100	100	100	100
2071	100	100	100	100
2072	100	100	100	100
2073	100	100	100	100
2074	100	100	100	100
2075	100	100	100	100
2076	100	100	100	100
2077	100	100	100	100
2078	100	100	100	100
2079	100	100	100	100
2080	100	100	100	100
2081	100	100	100	100
2082	100	100	100	100
2083	100	100	100	100
2084	100	100	100	100
2085	100	100	100	100
2086	100	100	100	100
2087	100	100	100	100
2088	100	100	100	100
2089	100	100	100	100
2090	100	100	100	100
2091	100	100	100	100
2092	100	100	100	100
2093	100	100	100	100
2094	100	100	100	100
2095	100	100	100	100
2096	100	100	100	100
2097	100	100	100	100
2098	100	100	100	100
2099	100	100	100	100
2100	100	100	100	100

Item 5. The proposal's major concept is to promote men to higher petty officer grades on a basis of leadership ability as well as technical skill and to advance men to higher pay levels within grade based on technical ability. How do you feel about this concept?

TABLE 2

DISTRIBUTION OF RESPONSES TO PROMOTION ON A BASIS OF LEADERSHIP ABILITY AND ADVANCEMENT TO HIGHER PAY LEVELS ON A BASIS OF TECHNICAL ABILITY

Grade	No.	Definitely in Favor	Somewhat in Favor	Indifferent/ Neutral	Somewhat Opposed	Definitely Opposed
E-9	2	100.0%	0.0%	0.0%	0.0%	0.0%
E-8	2	100.0%	0.0%	0.0%	0.0%	0.0%
E-7	8	25.0%	25.0%	12.5%	25.0%	12.5%
E-6	37	35.1%	35.1%	5.4%	16.3%	8.1%
E-5	47	42.6%	34.0%	9.5%	14.9%	0.0%
E-4	60	26.7%	36.7%	25.0%	8.3%	3.3%
E-3	41	36.6%	36.6%	21.9%	4.9%	0.0%
E-2	52	32.7%	32.7%	11.5%	13.5%	9.6%
Total Sample	249	35.1%	34.1%	14.8%	11.6%	4.4%





Item 6. How do you feel about the length of time for advancement in-grade under the present system.

TABLE 3

DISTRIBUTION OF RESPONSES TO THE LENGTH OF TIME FOR ADVANCEMENT FROM E-2 TO E-3 (PRESENT SYSTEM)

Grade	No.	Too Short	About Right	Too Long	Undecided
E-9	2	50.0%	50.0%	0.0%	0.0%
E-8	2	100.0%	0.0%	0.0%	0.0%
E-7	8	25.0%	75.0%	0.0%	0.0%
E-6	37	27.0%	70.3%	0.0%	2.7%
E-5	47	19.2%	66.0%	2.1%	12.7%
E-4	60	16.7%	70.0%	3.3%	10.0%
E-3	41	12.2%	83.0%	2.4%	2.4%
E-2	52	11.5%	82.7%	3.85%	1.95%
Total Sample	249	18.1%	73.5%	2.3%	6.1%





Item 6. How do you feel about the length of time for advancement in-grade under the present system?

TABLE 4

DISTRIBUTION OF RESPONSES TO THE LENGTH OF TIME FOR  
ADVANCEMENT FROM E-3 TO E-4 (PRESENT SYSTEM)

Grade	No.	Too Short	About Right	Too Long	Undecided
E-9	2	50.0%	50.0%	0.0%	0.0%
E-8	2	100.0%	0.0%	0.0%	0.0%
E-7	8	50.0%	50.0%	0.0%	0.0%
E-6	37	40.6%	56.7%	0.0%	2.7%
E-5	47	36.1%	49.0%	2.2%	12.7%
E-4	60	26.7%	60.0%	3.3%	10.0%
E-3	41	17.1%	78.0%	4.0%	0.0%
E-2	52	21.2%	71.1%	7.7%	0.0%
Total Sample	249	29.4%	61.8%	3.6%	5.2%

1. The following table shows the number of students who took part in the sports activities in the school during the last year.

Use the data in the table to complete the following questions.

Activity	Boys	Girls	Total
Football	120	80	200
Basketball	90	60	150
Table Tennis	50	40	90
Badminton	30	20	50
Swimming	20	10	30
Other	10	5	15

Item 6. How do you feel about the length of time for advancement in-grade under the present system?

TABLE 5

DISTRIBUTION OF RESPONSES TO THE LENGTH OF TIME FOR ADVANCEMENT FROM E-4 TO E-5 (PRESENT SYSTEM)

Grade	No.	Too Short	About Right	Too Long	Undecided
E-9	2	50.0%	50.0%	0.0%	0.0%
E-8	2	100.0%	0.0%	0.0%	0.0%
E-7	8	50.0%	50.0%	0.0%	0.0%
E-6	37	24.3%	73.0%	0.0%	2.7%
E-5	47	36.3%	46.7%	42.5%	10.5%
E-4	60	13.3%	73.4%	8.3%	5.0%
E-3	41	14.6%	78.0%	4.9%	2.5%
E-2	52	21.2%	63.5%	11.5%	3.8%
Total Sample	249	22.9%	66.2%	6.1%	4.8%

TABLE 1. The effect of the concentration of the solution on the rate of the reaction.

TABLE 1

Concentration of the solution, g/l. The rate of the reaction, g/l. min.

Concentration of the solution, g/l.	Rate of the reaction, g/l. min.	Concentration of the solution, g/l.	Rate of the reaction, g/l. min.	Concentration of the solution, g/l.	Rate of the reaction, g/l. min.
0.1	0.01	0.2	0.02	0.3	0.03
0.2	0.02	0.4	0.04	0.5	0.05
0.3	0.03	0.6	0.06	0.7	0.07
0.4	0.04	0.8	0.08	0.9	0.09
0.5	0.05	1.0	0.10	1.1	0.11
0.6	0.06	1.2	0.12	1.3	0.13
0.7	0.07	1.4	0.14	1.5	0.15
0.8	0.08	1.6	0.16	1.7	0.17
0.9	0.09	1.8	0.18	1.9	0.19
1.0	0.10	2.0	0.20	2.1	0.21
1.1	0.11	2.2	0.22	2.3	0.23
1.2	0.12	2.4	0.24	2.5	0.25
1.3	0.13	2.6	0.26	2.7	0.27
1.4	0.14	2.8	0.28	2.9	0.29
1.5	0.15	3.0	0.30	3.1	0.31
1.6	0.16	3.2	0.32	3.3	0.33
1.7	0.17	3.4	0.34	3.5	0.35
1.8	0.18	3.6	0.36	3.7	0.37
1.9	0.19	3.8	0.38	3.9	0.39
2.0	0.20	4.0	0.40	4.1	0.41
2.1	0.21	4.2	0.42	4.3	0.43
2.2	0.22	4.4	0.44	4.5	0.45
2.3	0.23	4.6	0.46	4.7	0.47
2.4	0.24	4.8	0.48	4.9	0.49
2.5	0.25	5.0	0.50	5.1	0.51
2.6	0.26	5.2	0.52	5.3	0.53
2.7	0.27	5.4	0.54	5.5	0.55
2.8	0.28	5.6	0.56	5.7	0.57
2.9	0.29	5.8	0.58	5.9	0.59
3.0	0.30	6.0	0.60	6.1	0.61
3.1	0.31	6.2	0.62	6.3	0.63
3.2	0.32	6.4	0.64	6.5	0.65
3.3	0.33	6.6	0.66	6.7	0.67
3.4	0.34	6.8	0.68	6.9	0.69
3.5	0.35	7.0	0.70	7.1	0.71
3.6	0.36	7.2	0.72	7.3	0.73
3.7	0.37	7.4	0.74	7.5	0.75
3.8	0.38	7.6	0.76	7.7	0.77
3.9	0.39	7.8	0.78	7.9	0.79
4.0	0.40	8.0	0.80	8.1	0.81
4.1	0.41	8.2	0.82	8.3	0.83
4.2	0.42	8.4	0.84	8.5	0.85
4.3	0.43	8.6	0.86	8.7	0.87
4.4	0.44	8.8	0.88	8.9	0.89
4.5	0.45	9.0	0.90	9.1	0.91
4.6	0.46	9.2	0.92	9.3	0.93
4.7	0.47	9.4	0.94	9.5	0.95
4.8	0.48	9.6	0.96	9.7	0.97
4.9	0.49	9.8	0.98	9.9	0.99
5.0	0.50	10.0	1.00	10.1	1.01
5.1	0.51	10.2	1.02	10.3	1.03
5.2	0.52	10.4	1.04	10.5	1.05
5.3	0.53	10.6	1.06	10.7	1.07
5.4	0.54	10.8	1.08	10.9	1.09
5.5	0.55	11.0	1.10	11.1	1.11
5.6	0.56	11.2	1.12	11.3	1.13
5.7	0.57	11.4	1.14	11.5	1.15
5.8	0.58	11.6	1.16	11.7	1.17
5.9	0.59	11.8	1.18	11.9	1.19
6.0	0.60	12.0	1.20	12.1	1.21
6.1	0.61	12.2	1.22	12.3	1.23
6.2	0.62	12.4	1.24	12.5	1.25
6.3	0.63	12.6	1.26	12.7	1.27
6.4	0.64	12.8	1.28	12.9	1.29
6.5	0.65	13.0	1.30	13.1	1.31
6.6	0.66	13.2	1.32	13.3	1.33
6.7	0.67	13.4	1.34	13.5	1.35
6.8	0.68	13.6	1.36	13.7	1.37
6.9	0.69	13.8	1.38	13.9	1.39
7.0	0.70	14.0	1.40	14.1	1.41
7.1	0.71	14.2	1.42	14.3	1.43
7.2	0.72	14.4	1.44	14.5	1.45
7.3	0.73	14.6	1.46	14.7	1.47
7.4	0.74	14.8	1.48	14.9	1.49
7.5	0.75	15.0	1.50	15.1	1.51
7.6	0.76	15.2	1.52	15.3	1.53
7.7	0.77	15.4	1.54	15.5	1.55
7.8	0.78	15.6	1.56	15.7	1.57
7.9	0.79	15.8	1.58	15.9	1.59
8.0	0.80	16.0	1.60	16.1	1.61
8.1	0.81	16.2	1.62	16.3	1.63
8.2	0.82	16.4	1.64	16.5	1.65
8.3	0.83	16.6	1.66	16.7	1.67
8.4	0.84	16.8	1.68	16.9	1.69
8.5	0.85	17.0	1.70	17.1	1.71
8.6	0.86	17.2	1.72	17.3	1.73
8.7	0.87	17.4	1.74	17.5	1.75
8.8	0.88	17.6	1.76	17.7	1.77
8.9	0.89	17.8	1.78	17.9	1.79
9.0	0.90	18.0	1.80	18.1	1.81
9.1	0.91	18.2	1.82	18.3	1.83
9.2	0.92	18.4	1.84	18.5	1.85
9.3	0.93	18.6	1.86	18.7	1.87
9.4	0.94	18.8	1.88	18.9	1.89
9.5	0.95	19.0	1.90	19.1	1.91
9.6	0.96	19.2	1.92	19.3	1.93
9.7	0.97	19.4	1.94	19.5	1.95
9.8	0.98	19.6	1.96	19.7	1.97
9.9	0.99	19.8	1.98	19.9	1.99
10.0	1.00	20.0	2.00	20.1	2.01



Item 6. How do you feel about the length of time for advancement in-grade under the present system?

TABLE 6

DISTRIBUTION OF RESPONSES TO THE LENGTH OF TIME FOR  
ADVANCEMENT FROM E-5 TO E-6 (PRESENT SYSTEM)

Grade	No.	Too Short	About Right	Too Long	Undecided
E-9	2	0.0%	100.0%	0.0%	0.0%
E-8	2	50.0%	50.0%	0.0%	0.0%
E-7	8	25.0%	75.0%	0.0%	0.0%
E-6	37	16.4%	81.2%	2.7%	2.7%
E-5	47	23.3%	63.9%	6.4%	6.4%
E-4	60	16.6%	63.4%	10.0%	10.0%
E-3	52	17.3%	65.4%	13.5%	3.8%
Total Sample	249	18.1%	68.7%	8.4%	4.8%



Item 6. How do you feel about the length of time for advancement in-grade under the present system?

TABLE 7

DISTRIBUTION OF RESPONSES TO THE LENGTH OF TIME FOR  
ADVANCEMENT FROM E-6 TO E-7 (PRESENT SYSTEM)

Grade	No.	Too Short	About Right	Too Long	Undecided
E-9	2	0.0%	100.0%	0.0%	0.0%
E-8	2	50.0%	50.0%	0.0%	0.0%
E-7	8	0.0%	100.0%	0.0%	0.0%
E-6	37	9.1%	86.5%	5.4%	0.0%
E-5	47	14.9%	59.5%	12.8%	12.8%
E-4	60	16.6%	66.7%	6.7%	10.0%
E-3	41	21.9%	58.6%	17.1%	2.4%
E-2	52	13.5%	69.2%	13.5%	3.8%
Total Sample	249	15.2%	68.0%	10.8%	6.0%





Item 6. How do you feel about the length of time for advancement in-grade under the present system?

TABLE 8

DISTRIBUTION OF RESPONSES TO THE LENGTH OF TIME FOR  
ADVANCEMENT FROM E-7 TO E-8 (PRESENT SYSTEM)

Grade	No.	Too Short	About Right	Too Long	Undecided
E-9	2	0.0%	50.0%	50.0%	0.0%
E-8	2	0.0%	100.0%	0.0%	0.0%
E-7	8	12.5%	87.5%	0.0%	0.0%
E-6	37	8.1%	81.1%	5.4%	5.4%
E-5	47	17.1%	65.9%	4.3%	10.7%
E-4	60	18.3%	61.7%	8.3%	11.7%
E-3	41	17.1%	63.4%	17.1%	2.4%
E-2	52	15.3%	65.7%	13.4%	5.6%
Total Sample	249	14.4%	68.7%	9.7%	7.2%

Examination held on 22nd and 23rd June 1955  
 (Subject: *Mathematics*)

(10 marks)

Let  $f(x)$  be a function of  $x$  such that  $f(0) = 1$   
 and  $f'(x) = 2x f(x)$ .

$x$	$f(x)$	$f'(x)$	$f''(x)$	$f'''(x)$	$f^{(4)}(x)$
0	1	0	0	0	0
0.1	1.02	0.2	0.04	0.008	0.0016
0.2	1.08	0.4	0.16	0.064	0.0256
0.3	1.17	0.6	0.36	0.432	0.3456
0.4	1.29	0.8	0.64	1.024	1.6384
0.5	1.45	1.0	1.00	2.000	4.0000
0.6	1.67	1.2	1.44	3.456	8.2944
0.7	1.95	1.4	1.96	5.488	14.7456
0.8	2.32	1.6	2.56	8.192	24.5760
0.9	2.81	1.8	3.24	11.664	38.9664
1.0	3.44	2.0	4.00	16.000	57.6000

Item 6. How do you feel about the length of time for advancement in-grade under the present system?

TABLE 9

DISTRIBUTION OF RESPONSES TO THE LENGTH OF TIME FOR  
ADVANCEMENT FROM E-3 TO E-9 (PRESENT SYSTEM)

Grade	No.	Too Short	About Right	Too Long	Undecided
E-9	2	0.0%	50.0%	50.0%	0.0%
E-8	2	0.0%	100.0%	0.0%	0.0%
E-7	8	12.5%	87.5%	0.0%	0.0%
E-6	37	8.1%	81.1%	2.7%	8.1%
E-5	47	14.9%	66.0%	4.2%	14.9%
E-4	60	18.3%	61.7%	8.3%	11.7%
E-3	41	19.5%	58.6%	19.5%	2.4%
E-2	52	15.4%	65.4%	13.4%	5.8%
Total Sample	249	15.3%	66.7%	9.6%	8.4%





Item 7. How do you feel about the length of time for advancement in-grade under the proposed system?

TABLE 10

DISTRIBUTION OF RESPONSES TO THE LENGTH OF TIME FOR  
ADVANCEMENT FROM E-2 TO E-3 (PROPOSED SYSTEM)

Grade	No.	Too Short	About Right	Too Long	Undecided
E-9	2	0.0%	100.0%	0.0%	0.0%
E-8	2	50.0%	50.0%	0.0%	0.0%
E-7	8	0.0%	50.0%	12.5%	37.5%
E-6	37	2.7%	64.9%	21.6%	10.8%
E-5	47	4.3%	61.7%	21.3%	12.7%
E-4	60	5.0%	63.4%	16.6%	10.0%
E-3	41	0.0%	53.6%	39.0%	7.4%
E-2	52	0.0%	42.3%	53.8%	3.9%
Total Sample	249	2.8%	58.3%	29.3%	9.6%



Item 7. How do you feel about the length of time for advancement in-grade under the proposed system?

TABLE 11

DISTRIBUTION OF RESPONSES TO THE LENGTH OF TIME FOR  
ADVANCEMENT FROM E-3 TO E-4 (PROPOSED SYSTEM)

Grade	No.	Too Short	About Right	Too Long	Undecided
E-9	2	0.0%	100.0%	0.0%	0.0%
E-8	2	50.0%	50.0%	0.0%	0.0%
E-7	8	0.0%	50.0%	37.5%	12.5%
E-6	37	9.6%	54.1%	29.7%	8.6%
E-5	47	4.3%	48.9%	38.3%	8.5%
E-4	60	1.7%	56.7%	33.4%	8.2%
E-3	41	0.0%	39.0%	56.1%	4.9%
E-2	52	0.0%	34.6%	63.4%	2.0%
Total Sample	249	2.8%	47.4%	43.4%	6.4%





Item 7. How do you feel about the length of time for advancement in-grade under the proposed system?

TABLE 12

DISTRIBUTION OF RESPONSES TO THE LENGTH OF TIME FOR  
ADVANCEMENT FROM E-4 TO E-5 (PROPOSED SYSTEM)

Grade	No.	Too Short	About Right	Too Long	Undecided
E-9	2	0.0%	100.0%	0.0%	0.0%
E-8	2	50.0%	50.0%	0.0%	0.0%
E-7	8	0.0%	50.0%	25.0%	25.0%
E-6	37	5.4%	43.3%	43.3%	8.0%
E-5	47	2.1%	53.2%	36.2%	8.5%
E-4	60	1.7%	45.0%	50.0%	3.3%
E-3	41	0.0%	58.5%	36.6%	4.9%
E-2	52	0.0%	34.6%	63.5%	1.9%
Total Sample	249	3.6%	46.6%	44.6%	5.2%



Item 7. How do you feel about the length of time for advancement in-grade under the proposed system?

TABLE 13

DISTRIBUTION OF RESPONSES TO THE LENGTH OF TIME FOR  
ADVANCEMENT FROM E-5 TO E-6 (PROPOSED SYSTEM)

Grade	No.	Too Short	About Right	Too Long	Undecided
E-9	2	0.0%	100.0%	0.0%	0.0%
E-8	2	0.0%	100.0%	0.0%	0.0%
E-7	8	0.0%	37.5%	50.0%	12.5%
E-6	37	2.7%	37.8%	51.4%	8.0%
E-5	47	2.1%	43.9%	42.6%	6.4%
E-4	60	1.7%	46.7%	43.3%	8.3%
E-3	41	2.4%	53.5%	34.2%	4.9%
E-2	52	0.0%	38.5%	57.7%	3.8%
Total Sample	249	2.8%	47.0%	44.2%	6.0%

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1	2 3 4 5 6 7 8 9	10
11	12 13 14 15 16 17 18 19	20
21	22 23 24 25 26 27 28 29	30
31	32 33 34 35 36 37 38 39	40
41	42 43 44 45 46 47 48 49	50
51	52 53 54 55 56 57 58 59	60
61	62 63 64 65 66 67 68 69	70
71	72 73 74 75 76 77 78 79	80
81	82 83 84 85 86 87 88 89	90
91	92 93 94 95 96 97 98 99	100



Item 7. How do you feel about the length of time for advancement in-grade under the proposed system?

TABLE 14

DISTRIBUTION OF RESPONSES TO THE LENGTH OF TIME FOR  
ADVANCEMENT FROM E-6 TO E-7 (PROPOSED SYSTEM)

Grade	No.	Too Short	About Right	Too Long	Undecided
E-9	2	0.0%	100.0%	0.0%	0.0%
E-8	2	0.0%	100.0%	0.0%	0.0%
E-7	8	0.0%	37.5%	50.0%	12.5%
E-6	37	2.7%	32.5%	59.5%	5.3%
E-5	47	4.3%	40.4%	49.0%	6.4%
E-4	60	1.7%	45.0%	41.7%	11.6%
E-3	41	7.3%	51.2%	37.6%	4.9%
E-2	52	0.0%	40.4%	55.7%	3.9%
Total Sample	249	2.8%	43.0%	47.4%	6.8%

Memorandum for Mr. [Name] dated [Date] [Time] [Location] [Page]

Subject: [Topic]

Reference is made to [Document/Report] dated [Date] [Time] [Location] [Page]

[Header 1]	[Header 2]	[Header 3]	[Header 4]	[Header 5]	[Header 6]
[Text 1.1]	[Text 1.2]	[Text 1.3]	[Text 1.4]	[Text 1.5]	[Text 1.6]
[Text 2.1]	[Text 2.2]	[Text 2.3]	[Text 2.4]	[Text 2.5]	[Text 2.6]

Item 7. How do you feel about the length of time for advancement in-grade under the proposed system?

TABLE 15

DISTRIBUTION OF RESPONSES TO THE LENGTH OF TIME FOR  
ADVANCEMENT FROM E-7 TO E-8 (PROPOSED SYSTEM)

Grade	No.	Too Short	About Right	Too Long	Undecided
E-9	2	0.0%	0.0%	100.0%	0.0%
E-8	2	50.0%	50.0%	0.0%	0.0%
E-7	8	12.5%	25.0%	50.0%	12.5%
E-6	37	0.0%	40.6%	51.4%	8.0%
E-5	47	4.3%	49.0%	38.3%	8.4%
E-4	60	1.7%	48.3%	38.4%	11.6%
E-3	41	4.9%	48.8%	41.4%	4.9%
E-2	52	0.0%	42.3%	53.8%	3.9%
Total Sample	249	2.0%	45.0%	44.2%	8.8%

# THE UNIVERSITY OF CHICAGO DEPARTMENT OF CHEMISTRY RESEARCH REPORT

NO. 1000  
 THE UNIVERSITY OF CHICAGO  
 DEPARTMENT OF CHEMISTRY  
 CHICAGO, ILLINOIS

Author	Title	Year	Vol.	No.	Page
1001	1001	1001	1001	1001	1001
1002	1002	1002	1002	1002	1002
1003	1003	1003	1003	1003	1003
1004	1004	1004	1004	1004	1004
1005	1005	1005	1005	1005	1005
1006	1006	1006	1006	1006	1006
1007	1007	1007	1007	1007	1007
1008	1008	1008	1008	1008	1008
1009	1009	1009	1009	1009	1009
1010	1010	1010	1010	1010	1010



Item 7. How do you feel about the length of time for advancement in-grade under the proposed system?

TABLE 16

DISTRIBUTION OF RESPONSES TO THE LENGTH OF TIME FOR  
ADVANCEMENT FROM E-8 TO E-9 (PROPOSED SYSTEM)

Grade	No.	Too Short	About Right	Too Long	Undecided
E-9	2	0.0%	0.0%	100.0%	0.0%
E-8	2	50.0%	50.0%	0.0%	0.0%
E-7	8	12.5%	25.0%	50.0%	12.5%
E-6	37	2.7%	35.2%	54.1%	8.0%
E-5	47	4.3%	46.8%	40.4%	8.5%
E-4	60	0.0%	51.7%	36.7%	11.6%
E-3	41	4.9%	51.2%	39.0%	4.9%
E-2	52	0.0%	40.4%	53.8%	5.8%
Total Sample	249	2.0%	44.6%	44.2%	9.2%



Item 8. What effect do you feel the proposed advancement system would have on morale?

TABLE 17

DISTRIBUTION OF RESPONSES ON THE EFFECT OF THE PROPOSED  
ADVANCEMENT SYSTEM ON MORALE

Grade	No.	Improve	Remain Same	Get Worse	No Opinion
E-9	2	100.0%	0.0%	0.0%	0.0%
E-8	2	100.0%	0.0%	0.0%	0.0%
E-7	8	25.0%	25.0%	50.0%	0.0%
E-6	37	48.6%	35.1%	10.8%	5.5%
E-5	47	55.3%	21.3%	21.3%	2.1%
E-4	60	53.3%	31.7%	13.3%	1.7%
E-3	41	58.6%	19.5%	17.1%	4.9%
E-2	52	38.5%	34.6%	25.0%	1.9%
Total Sample	249	50.6%	28.1%	18.5%	2.8%

General Accounting Statement for the year ending 31st Dec 1921.

1921

Statement of Receipts and Payments for the year ending 31st Dec 1921.

Particulars	Receipts	Payments	Balance	Total
1920	100	100	100	100
1921	100	100	100	100
1922	100	100	100	100
1923	100	100	100	100
1924	100	100	100	100
1925	100	100	100	100
1926	100	100	100	100
1927	100	100	100	100
1928	100	100	100	100
1929	100	100	100	100
1930	100	100	100	100
1931	100	100	100	100
1932	100	100	100	100
1933	100	100	100	100
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2089	100	100	100	100
2090	100	100	100	100
2091	100	100	100	100
2092	100	100	100	100
2093	100	100	100	100
2094	100	100	100	100
2095	100	100	100	100
2096	100	100	100	100
2097	100	100	100	100
2098	100	100	100	100
2099	100	100	100	100
2100	100	100	100	100



Item 8. What effect do you feel the proposed advancement system would have on leadership ability?

TABLE 18

DISTRIBUTION OF RESPONSES ON THE EFFECT OF THE PROPOSED  
ADVANCEMENT SYSTEM ON LEADERSHIP ABILITY

Grade	No.	Improve	Remain Same	Get Worse	No Opinion
E-9	2	100.0%	0.0%	0.0%	0.0%
E-8	2	100.0%	0.0%	0.0%	0.0%
E-7	8	50.0%	37.5%	12.5%	0.0%
E-6	37	72.9%	21.6%	5.5%	0.0%
E-5	47	72.4%	21.3%	4.2%	0.0%
E-4	60	85.0%	11.6%	0.0%	3.4%
E-3	41	78.0%	14.6%	2.4%	4.9%
E-2	52	88.5%	7.7%	3.8%	0.0%
Total Sample	249	79.6%	15.2%	3.2%	2.0%



Item 8. What effect do you feel the proposed advancement system would have on supervisory ability?

TABLE 19

DISTRIBUTION OF RESPONSES ON THE EFFECT OF THE PROPOSED  
ADVANCEMENT SYSTEM ON SUPERVISORY ABILITY

Grade	No.	Improve	Remain Same	Get Worse	No Opinion
E-9	2	100.0%	0.0%	0.0%	0.0%
E-8	2	100.0%	0.0%	0.0%	0.0%
E-7	8	62.5%	25.0%	12.5%	0.0%
E-6	37	75.7%	21.6%	2.7%	0.0%
E-5	47	78.6%	19.3%	2.1%	0.0%
E-4	60	76.6%	16.6%	3.4%	3.4%
E-3	41	73.2%	17.1%	4.9%	4.9%
E-2	52	80.8%	17.3%	1.9%	0.0%
Total Sample	249	77.1%	18.1%	3.2%	1.6%

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DATE	DESCRIPTION	AMOUNT	CHECK NO.	ACCOUNT NO.	INITIALS
10/1/80	CASH ON HAND	100.00		101	
10/2/80	PAYROLL	250.00	101	102	
10/3/80	RENT	150.00	102	103	
10/4/80	UTILITIES	75.00	103	104	
10/5/80	SALES	300.00	104	105	
10/6/80	EXPENSES	125.00	105	106	
10/7/80	INVENTORY	175.00	106	107	
10/8/80	REVENUE	225.00	107	108	
10/9/80	DEBIT	100.00	108	109	
10/10/80	CREDIT	150.00	109	110	
10/11/80	SALES	200.00	110	111	
10/12/80	EXPENSES	100.00	111	112	
10/13/80	INVENTORY	150.00	112	113	
10/14/80	REVENUE	200.00	113	114	
10/15/80	DEBIT	100.00	114	115	
10/16/80	CREDIT	150.00	115	116	
10/17/80	SALES	200.00	116	117	
10/18/80	EXPENSES	100.00	117	118	
10/19/80	INVENTORY	150.00	118	119	
10/20/80	REVENUE	200.00	119	120	
10/21/80	DEBIT	100.00	120	121	
10/22/80	CREDIT	150.00	121	122	
10/23/80	SALES	200.00	122	123	
10/24/80	EXPENSES	100.00	123	124	
10/25/80	INVENTORY	150.00	124	125	
10/26/80	REVENUE	200.00	125	126	
10/27/80	DEBIT	100.00	126	127	
10/28/80	CREDIT	150.00	127	128	
10/29/80	SALES	200.00	128	129	
10/30/80	EXPENSES	100.00	129	130	
10/31/80	INVENTORY	150.00	130	131	
10/31/80	REVENUE	200.00	131	132	
10/31/80	DEBIT	100.00	132	133	
10/31/80	CREDIT	150.00	133	134	
10/31/80	SALES	200.00	134	135	
10/31/80	EXPENSES	100.00	135	136	
10/31/80	INVENTORY	150.00	136	137	
10/31/80	REVENUE	200.00	137	138	
10/31/80	DEBIT	100.00	138	139	
10/31/80	CREDIT	150.00	139	140	
10/31/80	SALES	200.00	140	141	
10/31/80	EXPENSES	100.00	141	142	
10/31/80	INVENTORY	150.00	142	143	
10/31/80	REVENUE	200.00	143	144	
10/31/80	DEBIT	100.00	144	145	
10/31/80	CREDIT	150.00	145	146	
10/31/80	SALES	200.00	146	147	
10/31/80	EXPENSES	100.00	147	148	
10/31/80	INVENTORY	150.00	148	149	
10/31/80	REVENUE	200.00	149	150	
10/31/80	DEBIT	100.00	150	151	
10/31/80	CREDIT	150.00	151	152	
10/31/80	SALES	200.00	152	153	
10/31/80	EXPENSES	100.00	153	154	
10/31/80	INVENTORY	150.00	154	155	
10/31/80	REVENUE	200.00	155	156	
10/31/80	DEBIT	100.00	156	157	
10/31/80	CREDIT	150.00	157	158	
10/31/80	SALES	200.00	158	159	
10/31/80	EXPENSES	100.00	159	160	
10/31/80	INVENTORY	150.00	160	161	
10/31/80	REVENUE	200.00	161	162	
10/31/80	DEBIT	100.00	162	163	
10/31/80	CREDIT	150.00	163	164	
10/31/80	SALES	200.00	164	165	
10/31/80	EXPENSES	100.00	165	166	
10/31/80	INVENTORY	150.00	166	167	
10/31/80	REVENUE	200.00	167	168	
10/31/80	DEBIT	100.00	168	169	
10/31/80	CREDIT	150.00	169	170	
10/31/80	SALES	200.00	170	171	
10/31/80	EXPENSES	100.00	171	172	
10/31/80	INVENTORY	150.00	172	173	
10/31/80	REVENUE	200.00	173	174	
10/31/80	DEBIT	100.00	174	175	
10/31/80	CREDIT	150.00	175	176	
10/31/80	SALES	200.00	176	177	
10/31/80	EXPENSES	100.00	177	178	
10/31/80	INVENTORY	150.00	178	179	
10/31/80	REVENUE	200.00	179	180	
10/31/80	DEBIT	100.00	180	181	
10/31/80	CREDIT	150.00	181	182	
10/31/80	SALES	200.00	182	183	
10/31/80	EXPENSES	100.00	183	184	
10/31/80	INVENTORY	150.00	184	185	
10/31/80	REVENUE	200.00	185	186	
10/31/80	DEBIT	100.00	186	187	
10/31/80	CREDIT	150.00	187	188	
10/31/80	SALES	200.00	188	189	
10/31/80	EXPENSES	100.00	189	190	
10/31/80	INVENTORY	150.00	190	191	
10/31/80	REVENUE	200.00	191	192	
10/31/80	DEBIT	100.00	192	193	
10/31/80	CREDIT	150.00	193	194	
10/31/80	SALES	200.00	194	195	
10/31/80	EXPENSES	100.00	195	196	
10/31/80	INVENTORY	150.00	196	197	
10/31/80	REVENUE	200.00	197	198	
10/31/80	DEBIT	100.00	198	199	
10/31/80	CREDIT	150.00	199	200	



Item 8. What effect do you feel the proposed advancement system would have on productive motivation?

TABLE 20

DISTRIBUTION OF RESPONSES ON THE EFFECT OF THE PROPOSED  
ADVANCEMENT SYSTEM ON PRODUCTIVE MOTIVATION

Grade	No.	Improve	Remain Same	Get Worse	No Opinion
E-9	2	100.0%	0.0%	0.0%	0.0%
E-8	2	100.0%	0.0%	0.0%	0.0%
E-7	8	50.0%	12.5%	37.5%	0.0%
E-6	37	48.7%	40.6%	8.1%	2.6%
E-5	47	44.7%	29.8%	23.4%	2.2%
E-4	60	56.6%	31.7%	8.3%	3.4%
E-3	41	53.7%	24.4%	14.6%	7.3%
E-2	52	51.9%	32.7%	13.5%	1.9%
Total Sample	249	52.2%	30.5%	14.1%	3.2%



Item 8. What effect do you feel the proposed advancement system would have on career retention?

TABLE 21

DISTRIBUTION OF RESPONSES ON THE EFFECT OF THE PROPOSED  
ADVANCEMENT SYSTEM ON CAREER RETENTION

Grade	No.	Improve	Remain Same	Get Worse	No Opinion
E-9	2	100.0%	0.0%	0.0%	0.0%
E-8	2	100.0%	0.0%	0.0%	0.0%
E-7	8	12.5%	62.5%	25.0%	0.0%
E-6	37	37.8%	37.8%	24.4%	0.0%
E-5	47	49.0%	23.4%	23.4%	4.2%
E-4	60	56.7%	18.3%	20.0%	5.0%
E-3	41	53.7%	14.6%	24.4%	7.3%
E-2	52	32.7%	38.5%	26.9%	1.9%
Total Sample	249	46.2%	26.5%	23.3%	4.0%





Item 8. What effect do you feel the proposed advancement system would have on prestige?

TABLE 22

DISTRIBUTION OF RESPONSES ON THE EFFECT OF THE PROPOSED  
ADVANCEMENT SYSTEM ON PRESTIGE

Grade	No.	Improve	Remain Same	Get Worse	No Opinion
E-9	2	100.0%	0.0%	0.0%	0.0%
E-8	2	100.0%	0.0%	0.0%	0.0%
E-7	8	37.5%	50.0%	12.5%	0.0%
E-6	37	59.4%	32.5%	8.1%	0.0%
E-5	47	76.6%	14.9%	6.4%	2.1%
E-4	60	75.0%	15.0%	5.0%	5.0%
E-3	41	58.5%	24.4%	12.2%	4.9%
E-2	52	63.5%	25.0%	9.6%	1.9%
Total Sample	249	67.1%	22.1%	8.0%	2.8%

TABLE 1

Summary of the results of the analysis of variance for the different groups of subjects

Group	Mean	Standard Error	Standard Deviation	Variance	F	df
1	10.5	0.5	1.5	2.25	1.0	1
2	11.0	0.5	1.5	2.25	1.0	1
3	11.5	0.5	1.5	2.25	1.0	1
4	12.0	0.5	1.5	2.25	1.0	1
5	12.5	0.5	1.5	2.25	1.0	1
6	13.0	0.5	1.5	2.25	1.0	1
7	13.5	0.5	1.5	2.25	1.0	1
8	14.0	0.5	1.5	2.25	1.0	1
9	14.5	0.5	1.5	2.25	1.0	1
10	15.0	0.5	1.5	2.25	1.0	1
11	15.5	0.5	1.5	2.25	1.0	1
12	16.0	0.5	1.5	2.25	1.0	1
13	16.5	0.5	1.5	2.25	1.0	1
14	17.0	0.5	1.5	2.25	1.0	1
15	17.5	0.5	1.5	2.25	1.0	1
16	18.0	0.5	1.5	2.25	1.0	1
17	18.5	0.5	1.5	2.25	1.0	1
18	19.0	0.5	1.5	2.25	1.0	1
19	19.5	0.5	1.5	2.25	1.0	1
20	20.0	0.5	1.5	2.25	1.0	1
21	20.5	0.5	1.5	2.25	1.0	1
22	21.0	0.5	1.5	2.25	1.0	1
23	21.5	0.5	1.5	2.25	1.0	1
24	22.0	0.5	1.5	2.25	1.0	1
25	22.5	0.5	1.5	2.25	1.0	1
26	23.0	0.5	1.5	2.25	1.0	1
27	23.5	0.5	1.5	2.25	1.0	1
28	24.0	0.5	1.5	2.25	1.0	1
29	24.5	0.5	1.5	2.25	1.0	1
30	25.0	0.5	1.5	2.25	1.0	1
31	25.5	0.5	1.5	2.25	1.0	1
32	26.0	0.5	1.5	2.25	1.0	1
33	26.5	0.5	1.5	2.25	1.0	1
34	27.0	0.5	1.5	2.25	1.0	1
35	27.5	0.5	1.5	2.25	1.0	1
36	28.0	0.5	1.5	2.25	1.0	1
37	28.5	0.5	1.5	2.25	1.0	1
38	29.0	0.5	1.5	2.25	1.0	1
39	29.5	0.5	1.5	2.25	1.0	1
40	30.0	0.5	1.5	2.25	1.0	1
41	30.5	0.5	1.5	2.25	1.0	1
42	31.0	0.5	1.5	2.25	1.0	1
43	31.5	0.5	1.5	2.25	1.0	1
44	32.0	0.5	1.5	2.25	1.0	1
45	32.5	0.5	1.5	2.25	1.0	1
46	33.0	0.5	1.5	2.25	1.0	1
47	33.5	0.5	1.5	2.25	1.0	1
48	34.0	0.5	1.5	2.25	1.0	1
49	34.5	0.5	1.5	2.25	1.0	1
50	35.0	0.5	1.5	2.25	1.0	1
51	35.5	0.5	1.5	2.25	1.0	1
52	36.0	0.5	1.5	2.25	1.0	1
53	36.5	0.5	1.5	2.25	1.0	1
54	37.0	0.5	1.5	2.25	1.0	1
55	37.5	0.5	1.5	2.25	1.0	1
56	38.0	0.5	1.5	2.25	1.0	1
57	38.5	0.5	1.5	2.25	1.0	1
58	39.0	0.5	1.5	2.25	1.0	1
59	39.5	0.5	1.5	2.25	1.0	1
60	40.0	0.5	1.5	2.25	1.0	1
61	40.5	0.5	1.5	2.25	1.0	1
62	41.0	0.5	1.5	2.25	1.0	1
63	41.5	0.5	1.5	2.25	1.0	1
64	42.0	0.5	1.5	2.25	1.0	1
65	42.5	0.5	1.5	2.25	1.0	1
66	43.0	0.5	1.5	2.25	1.0	1
67	43.5	0.5	1.5	2.25	1.0	1
68	44.0	0.5	1.5	2.25	1.0	1
69	44.5	0.5	1.5	2.25	1.0	1
70	45.0	0.5	1.5	2.25	1.0	1
71	45.5	0.5	1.5	2.25	1.0	1
72	46.0	0.5	1.5	2.25	1.0	1
73	46.5	0.5	1.5	2.25	1.0	1
74	47.0	0.5	1.5	2.25	1.0	1
75	47.5	0.5	1.5	2.25	1.0	1
76	48.0	0.5	1.5	2.25	1.0	1
77	48.5	0.5	1.5	2.25	1.0	1
78	49.0	0.5	1.5	2.25	1.0	1
79	49.5	0.5	1.5	2.25	1.0	1
80	50.0	0.5	1.5	2.25	1.0	1
81	50.5	0.5	1.5	2.25	1.0	1
82	51.0	0.5	1.5	2.25	1.0	1
83	51.5	0.5	1.5	2.25	1.0	1
84	52.0	0.5	1.5	2.25	1.0	1
85	52.5	0.5	1.5	2.25	1.0	1
86	53.0	0.5	1.5	2.25	1.0	1
87	53.5	0.5	1.5	2.25	1.0	1
88	54.0	0.5	1.5	2.25	1.0	1
89	54.5	0.5	1.5	2.25	1.0	1
90	55.0	0.5	1.5	2.25	1.0	1
91	55.5	0.5	1.5	2.25	1.0	1
92	56.0	0.5	1.5	2.25	1.0	1
93	56.5	0.5	1.5	2.25	1.0	1
94	57.0	0.5	1.5	2.25	1.0	1
95	57.5	0.5	1.5	2.25	1.0	1
96	58.0	0.5	1.5	2.25	1.0	1
97	58.5	0.5	1.5	2.25	1.0	1
98	59.0	0.5	1.5	2.25	1.0	1
99	59.5	0.5	1.5	2.25	1.0	1
100	60.0	0.5	1.5	2.25	1.0	1

Item 8. What effect do you feel the proposed advancement system would have on discipline?

TABLE 23

DISTRIBUTION OF RESPONSES ON THE EFFECT OF THE PROPOSED  
ADVANCEMENT SYSTEM ON DISCIPLINE

Grade	No.	Improve	Remain Same	Get Worse	No Opinion
E-9	2	100.0%	0.0%	0.0%	0.0%
E-8	2	100.0%	0.0%	0.0%	0.0%
E-7	8	25.0%	62.5%	12.5%	0.0%
E-6	37	45.9%	48.7%	2.7%	2.7%
E-5	47	49.0%	40.5%	6.4%	4.2%
E-4	60	51.6%	41.7%	1.7%	5.0%
E-3	41	41.4%	48.8%	4.9%	4.9%
E-2	52	44.3%	51.8%	3.9%	0.0%
Total Sample	249	47.0%	45.0%	4.0%	4.0%





Item 8. What effect do you feel the proposed advancement system would have on respect for the petty officer?

TABLE 24

DISTRIBUTION OF RESPONSES ON THE EFFECT OF THE PROPOSED  
ADVANCEMENT SYSTEM ON RESPECT FOR THE PETTY OFFICER

Grade	No.	Improve	Remain Same	Get Worse	No Opinion
E-9	2	100.0%	0.0%	0.0%	0.0%
E-8	2	100.0%	0.0%	0.0%	0.0%
E-7	8	37.5%	50.0%	12.5%	0.0%
E-6	37	59.4%	35.2%	5.4%	0.0%
E-5	47	68.1%	21.3%	6.4%	4.2%
E-4	60	70.0%	25.0%	0.0%	5.0%
E-3	41	51.3%	31.7%	7.3%	9.7%
E-2	52	59.6%	34.6%	3.9%	1.9%
Total Sample	249	62.3%	29.3%	4.4%	4.0%

Before beginning, please read the instructions on the back of the card. The results will be printed on the back of the card.

### RESULTS

Results are shown in the table below. The results are shown in the table below. The results are shown in the table below.

Test	Result	Score	Grade	Level	Level
100	100	100	100	100	100
90	90	90	90	90	90
80	80	80	80	80	80
70	70	70	70	70	70
60	60	60	60	60	60
50	50	50	50	50	50
40	40	40	40	40	40
30	30	30	30	30	30
20	20	20	20	20	20
10	10	10	10	10	10
0	0	0	0	0	0

Item 9. The reason most men want to advance in-grade is for the increase in status.

TABLE 25

DISTRIBUTION OF RESPONSES TO ADVANCEMENT IN-GRADE FOR  
INCREASE IN STATUS

Grade	No.	Strongly Agree	Agree	Disagree	Strongly Disagree	No Opinion
E-9	2	0.0%	100.0%	0.0%	0.0%	0.0%
E-8	2	0.0%	100.0%	0.0%	0.0%	0.0%
E-7	8	12.5%	25.0%	50.0%	12.5%	0.0%
E-6	37	32.5%	37.8%	24.3%	2.7%	2.7%
E-5	47	12.8%	51.0%	23.4%	8.5%	4.3%
E-4	60	15.0%	53.4%	18.3%	8.3%	5.0%
E-3	41	17.0%	46.7%	21.8%	12.1%	2.4%
E-2	52	13.5%	51.9%	25.0%	5.8%	3.8%
Total Sample	249	16.7%	49.1%	22.8%	7.5%	3.9%





Item 10. The reason most men want to advance in-grade is for additional pay.

TABLE 26

DISTRIBUTION OF RESPONSES TO ADVANCEMENT IN-GRADE FOR  
ADDITIONAL PAY

Grade	No.	Strongly Agree	Agree	Disagree	Strongly Disagree	No Opinion
E-9	2	50.0%	50.0%	0.0%	0.0%	0.0%
E-8	2	100.0%	0.0%	0.0%	0.0%	0.0%
E-7	8	62.5%	25.0%	0.0%	12.5%	0.0%
E-6	37	46.0%	43.2%	0.0%	0.0%	2.7%
E-5	47	51.0%	40.4%	4.3%	0.0%	4.3%
E-4	60	56.7%	36.8%	1.6%	1.6%	3.3%
E-3	41	65.8%	31.7%	0.0%	0.0%	2.5%
E-2	52	44.3%	53.7%	0.0%	0.0%	2.0%
Total Sample	249	53.4%	40.6 %	2.4%	0.8%	2.8%



Item 11. Real status begins with:

TABLE 27

DISTRIBUTION OF RESPONSES AT WHICH GRADE REAL STATUS  
BEGINS

Grade	No.	E-4	E-5	E-6	E-7	E-8	E-9	No Comment
E-9	2	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%
E-8	2	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%
E-7	8	12.5%	12.5%	50.0%	25.0%	0.0%	0.0%	0.0%
E-6	37	5.4%	21.6%	18.9%	43.3%	8.1%	0.0%	2.7%
E-5	47	2.2%	21.2%	34.0%	32.2%	2.2%	2.2%	0.0%
E-4	60	11.7%	31.6%	26.7%	21.7%	3.3%	0.0%	5.0%
E-3	41	21.9%	21.9%	24.4%	29.3%	0.0%	0.0%	2.5%
E-2	52	32.7%	30.7%	21.2%	9.6%	0.0%	5.8%	0.0%
Total Sample	249	14.9%	26.2%	26.5%	26.5%	2.3%	1.6%	2.0%





Item 12. I feel that each grade has the prestige it deserves.

TABLE 28

DISTRIBUTION OF RESPONSES TO EACH GRADE HAS THE STATUS  
IT DESERVES

Grade	No.	Strongly Agree	Agree	Disagree	Strongly Disagree	No Opinion
E-9	2	0.0%	100.0%	0.0%	0.0%	0.0%
E-8	2	0.0%	0.0%	50.0%	50.0%	0.0%
E-7	8	25.0%	25.0%	50.0%	0.0%	0.0%
E-6	37	5.4%	10.8%	48.6%	35.2%	0.0%
E-5	47	6.4%	10.6%	36.2%	44.7%	2.4%
E-4	60	0.0%	16.7%	46.6%	30.0%	6.7%
E-3	41	2.4%	34.3%	41.4%	14.6%	7.3%
E-2	52	3.8%	46.2%	40.4%	5.8%	3.8%
Total Sample	249	4.0%	24.5%	42.6%	24.9%	4.0%

TABLE II. Theoretical values of the ratio  $R$  for various values of  $\alpha$ .

TABLE II

THEORETICAL VALUES OF THE RATIO  $R$  FOR VARIOUS VALUES OF  $\alpha$

$\alpha$	$R$	$R$	$R$	$R$	$R$	$R$
0.1	0.999	0.999	0.999	0.999	0.999	0.999
0.2	0.996	0.996	0.996	0.996	0.996	0.996
0.3	0.992	0.992	0.992	0.992	0.992	0.992
0.4	0.988	0.988	0.988	0.988	0.988	0.988
0.5	0.984	0.984	0.984	0.984	0.984	0.984
0.6	0.980	0.980	0.980	0.980	0.980	0.980
0.7	0.976	0.976	0.976	0.976	0.976	0.976
0.8	0.972	0.972	0.972	0.972	0.972	0.972
0.9	0.968	0.968	0.968	0.968	0.968	0.968
1.0	0.964	0.964	0.964	0.964	0.964	0.964

Item 13. Do you feel that a graduated increase of pay within grade would be a better incentive to "ship over" than the variable "shipping over" bonus presently in use?

TABLE 29

DISTRIBUTION OF RESPONSES TO A GRADUATED INCREASE IN  
PAY AS INCENTIVE TO "SHIP OVER"

Grade	No.	Yes	No	No Opinion
E-9	2	100.0%	0.0%	0.0%
E-8	2	50.0%	50.0%	0.0%
E-7	8	62.5%	25.0%	12.5%
E-6	37	64.9%	18.9%	16.2%
E-5	47	49.0%	38.3%	12.7%
E-4	60	53.4%	31.6%	10.0%
E-3	41	46.4%	39.0%	14.6%
E-2	52	40.4%	48.0%	11.6%
Total Sample	249	52.3%	34.9%	12.8%

These studies are to determine whether a 100% duty rate is  
 justified for a particular country or group of countries  
 based on the following criteria: (1) the country's  
 economic situation; (2) the country's political situation;  
 and (3) the country's social situation.

# TABLE 1

1. Countries included in the study of countries to determine  
 whether a 100% duty rate is justified.

Country	1961	1962	1963	1964
Algeria	10.0	10.0	10.0	10.0
Argentina	10.0	10.0	10.0	10.0
Australia	10.0	10.0	10.0	10.0
Belgium	10.0	10.0	10.0	10.0
Brazil	10.0	10.0	10.0	10.0
Canada	10.0	10.0	10.0	10.0
France	10.0	10.0	10.0	10.0
Germany	10.0	10.0	10.0	10.0
India	10.0	10.0	10.0	10.0
Italy	10.0	10.0	10.0	10.0
Japan	10.0	10.0	10.0	10.0
South Korea	10.0	10.0	10.0	10.0
Spain	10.0	10.0	10.0	10.0
Sweden	10.0	10.0	10.0	10.0
Switzerland	10.0	10.0	10.0	10.0
Taiwan	10.0	10.0	10.0	10.0
United Kingdom	10.0	10.0	10.0	10.0
United States	10.0	10.0	10.0	10.0
Yugoslavia	10.0	10.0	10.0	10.0



Item 14. Do you feel that the variable "shipping over" bonus retains people who are more impressed with the amount of the bonus than they are interested in a career in the Navy?

TABLE 30

DISTRIBUTION OF RESPONSES ON THE EFFECT OF THE VARIABLE  
"SHIPPING OVER" BONUS

Grade	No.	Yes	No	No Opinion
E-9	2	100.0%	0.0%	0.0%
E-8	2	100.0%	0.0%	0.0%
E-7	8	87.5%	12.5%	0.0%
E-6	37	78.4%	18.9%	2.7%
E-5	47	74.5%	21.3%	4.2%
E-4	60	58.4%	23.4%	18.2%
E-3	41	48.8%	34.2%	17.0%
E-2	52	67.4%	23.0%	9.6%
Total Sample	249	66.3%	23.3%	10.4%

THESE RESULTS WERE OBTAINED BY MEANS OF THE FOLLOWING EXPERIMENTAL PROCEDURE: A SOLUTION OF THE POLYMER WAS DILUTED WITH WATER AND THE DILUTION WAS MADE IN SUCH A MANNER THAT THE POLYMER CONCENTRATION WAS 0.1%.

## RESULTS

THE RESULTS OF THE EXPERIMENTAL WORK ARE SUMMARIZED IN THE FOLLOWING TABLE.

Time, min.	$\eta_{sp}/c$	$\eta_{sp}/c$	$\eta_{sp}/c$	$\eta_{sp}/c$
0	0.00	0.00	0.00	0.00
10	0.01	0.01	0.01	0.01
20	0.02	0.02	0.02	0.02
30	0.03	0.03	0.03	0.03
40	0.04	0.04	0.04	0.04
50	0.05	0.05	0.05	0.05
60	0.06	0.06	0.06	0.06
70	0.07	0.07	0.07	0.07
80	0.08	0.08	0.08	0.08
90	0.09	0.09	0.09	0.09
100	0.10	0.10	0.10	0.10
110	0.11	0.11	0.11	0.11
120	0.12	0.12	0.12	0.12
130	0.13	0.13	0.13	0.13
140	0.14	0.14	0.14	0.14
150	0.15	0.15	0.15	0.15
160	0.16	0.16	0.16	0.16
170	0.17	0.17	0.17	0.17
180	0.18	0.18	0.18	0.18
190	0.19	0.19	0.19	0.19
200	0.20	0.20	0.20	0.20

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CONFIDENTIAL

SECRET

1. The purpose of this document is to provide information regarding the activities of the [redacted] in the [redacted] area.

2. The [redacted] has been observed in the [redacted] area, and it is believed that it is engaged in [redacted] activities.

3. The [redacted] has been observed in the [redacted] area, and it is believed that it is engaged in [redacted] activities.

4. The [redacted] has been observed in the [redacted] area, and it is believed that it is engaged in [redacted] activities.

5. The [redacted] has been observed in the [redacted] area, and it is believed that it is engaged in [redacted] activities.

6. The [redacted] has been observed in the [redacted] area, and it is believed that it is engaged in [redacted] activities.

7. The [redacted] has been observed in the [redacted] area, and it is believed that it is engaged in [redacted] activities.

8. The [redacted] has been observed in the [redacted] area, and it is believed that it is engaged in [redacted] activities.

9. The [redacted] has been observed in the [redacted] area, and it is believed that it is engaged in [redacted] activities.



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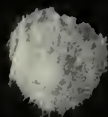
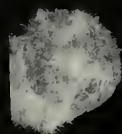
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